THE

VETERINARY JOURNAL

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Editorial.

VETERINARY EDUCATION IN THE UNITED KINGDOM, AMERICA, AND THE CONTINENT OF EUROPE.

IT may generally be taken as a sign of progress and reform when discontent is manifested, and a glance at the lucid and thorough article on Veterinary Education as it exists in America at the present moment, by a writer who is thoroughly conversant with his subject and only too anxious to improve matters, will make the profession in England more and more contented with their one portal system, and perhaps solace the Members of the Examining Board when they are compelled to leave their practices and journey from place to place to find their students, instead of the latter being brought to meet them at one common centre. The vast size of the American Continent, and the division into huge States, each with its own form of government, will always necessitate a number of veterinary schools, but there is no doubt that these ought to be under State control, with a uniform standard of educational requirement and a uniform standard of professional education. The courses, too, ought to be of the same duration, and the possibility of earning a veterinary diploma by evening classes only, or, worse still, by correspondence, should once and for ever be done away with.

As things exist at present some of the American Colleges are quite unworthy of the name, and that the graduates of these places should have equal rights to compete with those who have spent time and money in endeavouring to properly fit themselves to fulfil a useful place in society is not fair to the latter.

For years the enthusiastic and energetic editor of our contemporary, the *American Veterinary Review*, has been urging the question of educational reform in professional teaching as the quickest and surest way to obtain social recognition, and it must be somewhat gratifying to Professor Liautard to find that the American Veterinary Medical Society, and the Bureau of Animal Industry, together with the American Army officials, are at last taking the matter up; the former by refusing to admit graduates of certain schools to the privileges of membership, and the last two departments by only taking graduates of the best schools into their official employment. These three forces, working together, must in time make a perceptible impression on the social standing of the profession, and eventually, at all events in so far as the educational standards are concerned, the Government itself will be compelled to take this matter sternly in hand. In Great Britain and Ireland the entrance educational standard is now uniform for all the colleges, the matriculation being exactly the same as that required for students of human medicine; all the colleges have a four years course, and by an ambulatory Board of Examiners the one portal system is maintained. For a Board of Examiners to travel about America would be absurd and impossible, but some arrangement could doubtless be arrived at whereby the primary educational standard would be the same throughout the country, and the professional tests followed some uniform curriculum. In Germany, France, and other European Continental countries this plan is adopted and is proved to work very satisfactorily. A High School education is necessary in order to gain admission, and the students of veterinary medicine are quite on an equality with their medical *confrères*. It is certain that, with all the subjects of which a knowledge is required at the present time, four years is none too long, and the intellect of the student cannot receive too much polish before he embarks upon the stormy seas of a professional career.

Biography.

THE LATE PROFESSOR PRITCHARD, M.R.C.V.S., F.C.S.

It will be with sincere regret that the profession will read of the death of the above gentleman, with whom passes away another of the strong links which connect together the veterinary profession of the past and the present day. Professor Pritchard's name will always be placed amongst those who have materially helped to build up the edifice of our professional work. As a teacher he will always be remembered with respect by his colleagues and students, and after retiring from active work in this direction, he was kept energetically busy in the guidance of professional matters, either in the capacity of Councilman or as a member of the Board of Examiners.

Born on October 20, 1838, of a veterinary family, he saw his first pofessional work with his father, the late Mr. R. Pritchard, M.R.C.V.S., of Wolverhampton, graduating from the London Veterinary College in 1860. Always one of the foremost students (amongst whom he was chaffingly spoken of as the "Demonstrator," by his fellow pupils), he was selected, immediately after obtaining his qualification, to fill the post of Demonstrator of Anatomy. He became Professor of Anatomy upon the retirement of Professor Varnell, in 1867, and held this appointment until 1880, when he left the College and started in private and consulting practice in the North of London. As a consultant or surgical operator his opinion was much sought after by members of the profession, and as a keen judge of men and horses, few could surpass him. That he possessed the confidence of his professional brethren is shown by the fact that he was a member of Council at varying intervals for nearly twenty-one years, and President of the College in 1888 and 1889, whilst he held the post of Examiner in Veterinary Medicine from 1882 to 1888.

Professor Pritchard was, on many occasions, one of the veterinary advisers to the Royal Agricultural and kindred societies; he took an active part in connection with the Farriers Company, and with the Royal Society for the Prevention of Cruelty to Animals; he was a Fellow of the Chemical Society, and in social life was a member of the Savage and other clubs.

He died, as he would have wished, almost in harness, for, although he had had a severe cold for a few weeks, he visited his patients as usual until the morning of the 16th, when he was compelled to return home and go to bed. Death took place on the 20th from pneumonia and heart failure.

Professor Pritchard married, in 1878, the daughter of the late Principal of the College, Professor Spooner, and leaves a widow and one daughter to mourn his loss.

Original Articles.

EDUCATION AND EXAMINATIONS.

BY G. H. WOOLDRIDGE, F.R.C.V.S., PROFESSOR IN THE ROYAL VETERINARY COLLEGE OF IRELAND, DUBLIN.

It was not my intention to contribute further to the discussion on the above subject, having, fairly clearly I hope, put forward my humble opinion in previous issues of this Journal. But the article by Dr. Bradley in the October number compels me, however reluctant I may be, to do so. Professor Bradley seems to think that I have cast somewhat of a slur on the honour or honesty of veterinary teachers when I suggest *possible* favour or partiality towards particular candidates. He says, "Even if for the sake of argument we admit that the teachers in the veterinary schools have so low a code of honour, &c." I maintain that nobody reading my contribution with an open mind and with ordinary intelligence could take out such a meaning, especially when they bear in mind that I am also a teacher and was not likely to be calling my own honour into question. What I chiefly intended to convey was that the system of intern examiners is always open to such suspicions. We have all heard similar expressions with reference to one or other of the University examinations. "Observer" emphasises that same point in the November Journal with reference to the medical profession. I further proceeded to show that persons having such opinions would not have far to seek for possible motives, and it would not be very difficult to make out what might appear to be a strong case to a layman not acquainted with the true facts.

We all appreciate our "one portal" system, and I consider that the principle embodied in that would be in great danger if the sentries guarding it were different according to the school from which the candidate presented himself. I submit that a uniform standard of examination at the different schools could not be maintained under the proposed system. An unconscious variation would undoubtedly creep in. Of course, it is not suggested that there should be any other licensing body than the R.C.V.S., but that body is entirely guided, so far as the admission to the profession goes, by the examiners. Hence I submit that they would be surrendering half their power if they gave teachers an equal position with extern examiners on the examining board. In that event, if anything so deplorable should occur as disaffection on the part of any of the schools, and they were to attempt to obtain full licensing powers, they would be able to make out a strong case and gain many supporters if they could show that they already had a standing on the examining board equal to that of the extern examiners appointed by the R.C.V.S. I do not say that any such thing would happen, and I believe nothing is further from the minds at the present moment of those who advocate the change, but it behoves us to look before we leap, and see where our action might land us in the future. To me, however, it is not without significance that I observe that the only supporters of the suggested alteration are teachers in schools recently affiliated to universities, viz., Professor Bradley, R.V.C. Edinburgh, and Professor Woodruff,

R.V.C. London.* Is it possible that they are jealous of the apparent powers of teachers of the other schools of the respective universities? I may say, too, that I am not without experience of the suggested system, since I was for some years an intern examiner co-operating with an extern examiner in a diploma-granting college with a Royal Charter. As the result of my experience I am decidedly still of opinion that the present system of examination of the R.C.V.S. is the better. The other writers on the subject are apparently opposed to any change modelled on the lines suggested.

I suppose the present members of the examining board feel a certain amount of reticence in giving us their views on the question, since possibly they may consider that they are somewhat on trial. But I think they might do so quite easily since it is the "system" not the "board of examiners" that is being discussed.

However, fortunately we have recently been favoured with the opinion of a member of the profession who is held in very high esteem by all who know him, and who has always the welfare of the profession at heart. I refer to Mr. John Malcolm, F.R.C.V.S., who considered the subject of sufficient importance to refer to it at some length in his opening address at the Royal (Dick) Veterinary College, Edinburgh.† Mr. Malcolm has had a long experience as an Examiner for the Membership of the R.C.V.S., and is still on the examining board for the Fellowship. Consequently his opinion should carry considerable weight. After weighing up the "pros and cons," Mr. Malcolm sums up and says, "All things considered, under our special circumstances, *the external board*, notwithstanding inherent imperfections, *is immeasurably the best for all concerned.*"

No doubt there is still much to be said on the matter, but I must not trespass further on space which might be more profitably filled. I repeat what I said in my first contribution to the discussion, that although the existing scheme may not be perfect, yet stronger reasons for its rejection should be brought forward than any I have seen before a change would be justified.

VETERINARY EDUCATION IN AMERICA.

BY W. L. WILLIAMS, V.S., PROFESSOR IN THE NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY, U.S.A.

In writing of veterinary education in America, an American veterinarian by birth, education, and professional activity, and without personal knowledge of the veterinary institutions of other countries, cannot undertake any comparative study of American with foreign veterinary schools. On the other hand, he has the advantage of a more or less intimate personal knowledge of the schools of his own country, may interpret somewhat safely the existing data, knows something of the aims and ideals of each, understands in a measure the environment under which each college must work and the obstacles which need be overcome. After more than a quarter of a century of active participation

* VETERINARY JOURNAL, November, 1906, p. 611.

† VETERINARY JOURNAL, November, 1906, pp. 619-620.

in veterinary affairs, the writer can bring to his aid and guidance some of the lessons taught by the victories and defeats, the triumphs and disasters, which have occurred during a highly interesting and rapidly changing era in the development of a profession which, at the time of his entrance into it, was virtually in its infancy.

We are essaying to contribute an account of American veterinary education to a periodical which is read chiefly by others than Americans, most of whom probably have but vague ideas of the character of our schools, and possibly some are swayed by prejudices derived from imperfect data. English and European veterinary journals have occasionally written of our veterinary schools, but not always with an entirely clear insight into the actual conditions. In the *Veterinarian* for January, 1880, the late Mr. John Henry Steel, M.R.C.V.S., gives a somewhat extended historical review of the American veterinary colleges, with comments and criticisms, based primarily upon an article by Dr. Liautard in the *American Veterinary Review*. Foreign veterinarians travelling in America have given their countrymen more or less graphic accounts of our veterinary colleges, based upon fleeting visits to the institutions, with more or less imperfect impressions in various respects.

A veterinary college may be judged by at least two standards: Firstly, its stature, its size in buildings, equipment, faculty, students, alumni, and the work accomplished by its alumni in practice or in literature. Secondly, its vigour, the undeveloped potentiality existing within it, the field open before it, which must needs be adequately filled, the rate of growth in all material respects as shown from year to year or from decade to decade.

It shall be our endeavour to present, so far as we are able, in the columns of this Journal such data as we consider pertinent regarding American veterinary schools, and to avoid the drawing or suggesting of any conclusions, leaving these to the reader.

The early veterinary colleges of America were launched on tempestuous seas, some of them were soon hopelessly wrecked, others led a precarious existence for a time, only to decline and later perish, while a few continue to exist; but some of these are wanting in prosperity, vigour, or efficiency.

At the beginning of the nineteenth century the population of the United States and Canada was essentially rural. There were few cities (and these few not large), so that the numbers of horses or other draught animals used were small and these could be replaced at very low cost, while in the agricultural communities most animals were of low individual value and their health was spontaneously guarded by the semi-wild state in which they were largely kept, being almost constantly out of doors and having an abundance of good food. Agriculture was primitive and largely carried out by persons of limited means and virtually devoid of scientific knowledge.

The sickness and death of individual animals was looked upon as inevitable and of comparatively little consequence, as they were easily replaced; and it was only in the case of the occurrence of some animal plague that the community was aroused to a sense of its helplessness to stay the ravages.

Before veterinary schools could well be founded it was essential that some tangible veterinary profession should exist, and this must be

supplied from abroad or through self-made men at home. Each source supplied its quota, the latter naturally contributing the larger number while the former led in vigour and efficiency. The veterinarians coming from abroad were naturally mostly English, with individuals from Continental countries. Well-nigh without exception these first veterinarians settled in the Atlantic coast cities where they found satisfactory support in dealing chiefly with individual animals, leaving the agricultural communities without competent veterinary service in either individual cases or in the widespread animal scourges.

The conditions existing suggested to the pioneer veterinarians the desirability of veterinary colleges and led to early, if not mature, action, and as early as 1857 efforts had been made to found teaching schools. It is well to note that in the United States the Government gave its first attention to primary or common school education, extending its influence later to the high school, and, finally, during the last third of the nineteenth century, concerned itself with college, university, and technical instruction. During the period when neither State nor nation concerned itself materially with higher education, private individuals and corporations were given a free hand to do what they saw fit, and if any man, body of men or corporation desired permission for conducting an educational institution, a charter was readily granted without any important reservations as to the amount or character of education to be dispensed or any other governmental regulation or control.

This condition as relating to private educational institutions still prevails in most States of the Union, and an individual or company may secure a charter for conducting a veterinary college, and the State reserve no effective supervision over the character of equipment or teaching staff, the preliminary education, the curriculum, the duration of the course, the efficiency of the student, or the degrees conferred. They are a law unto themselves except the ultimate influence of public opinion. The State of New York now constitutes the most notable exception to this by defining the entrance requirements and duration of the course of instruction before a student may receive a veterinary degree.

Quebec, Manitoba and the other Canadian provinces, with New York and other States, direct that before a veterinarian can legally enter into practice within their respective jurisdictions, he must have attended a veterinary college for a given period of time ; he must have graduated, and in some of them (New York) must have passed certain preliminary examinations before entering college. In many states or provinces he must also pass an examination before a body of veterinary examiners provided by the Government. The licence of private colleges is thereby being gradually displaced by Governmental influence and control, either directly by stipulating the requirements for college entrance and graduation, or indirectly by defining the conditions upon which one may become a legal veterinary practitioner. Further important influences are being exerted upon private veterinary colleges by the regulations of the Agricultural and War Departments of the United States, by which the employment of veterinarians therein is limited to those who have attended a veterinary college having a course of at least three years of not less than six months each. A further indirect influence of some weight is exerted by the American Veterinary Medical Association, which includes in its membership veterinarians

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The first of these private veterinary colleges naturally were located in the seaboard cities in which there were enough veterinarians or others who might bind themselves together in some semblance of an organised faculty to constitute a college. The material for the construction of veterinary faculties was scant, heterogeneous, largely inefficient, and not rarely incompatible, and these facts had much to do with the early death of many of these primitive schools. They were virtually without buildings except such makeshifts as could be cheaply rented, had little equipment, no State aid, no endowments, and but scant public appreciation or moral support. The faculties were dependent for material compensation for their efforts upon the fees from students in attendance upon their courses; the increased prestige accorded them in their private practice on account of their college affiliation or the incentive which teaching gave, made them apply themselves to more careful study and gave them greater efficiency in practice. Aside from these incentives, some have certainly sacrificed personal welfare and laboured zealously for the advancement of the profession without material recompense, but on the whole probably the private colleges and their faculties have given to the student not more than that for which he has paid in the form of tuition. This is largely dictated by necessity, most veterinary teachers in America being poor and directly dependent upon their earnings for their living, thus, virtually without exception the private veterinary college must prove a financial success or it must close its doors. Sentiment cannot enter very deeply into the question.

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These colleges were promptly organised by the various States, and within ten years after the enactment of the first law, a large proportion of the States had agricultural colleges in active operation. In most of these veterinarians were employed to give instruction in veterinary science to agricultural students. These veterinarians were drawn almost wholly from Great Britain, and were men of high attainments.

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The Agricultural College did far more than this by contributing to the student ranks in the private veterinary colleges, young men well trained in academic and agricultural studies and with a good fundamental preparation in veterinary science, who secured and held high rank in the veterinary college classes and after graduation took leading positions in their profession.

As time went on and the demand for better educated veterinarians came from agriculturists, Veterinary Colleges appeared in several States in connection with the Agricultural Colleges, the funds for which were drawn from national or State appropriations. With the exception of military and naval schools, the United States administers no educational institutions, but makes appropriations from the national treasury to States and Territories for their use in the establishment and maintenance of agricultural, mechanical, veterinary or other technical education to which any State may add from its own treasury such amounts and at such times as it may see fit, or, as in New York State, the State may establish a State College of veterinary science wholly independent of the national government. Thus arose a second group of veterinary colleges which have steadily gained in numbers, vigour, and efficiency.

Not all veterinary colleges which have existed, or now exist in America, belong strictly to either of these classes. Some have partaken partly of the character of each.

The Montreal Veterinary College was established largely as a private institution, and received from the Province of Quebec, an annual stipend of $2,000, for which it granted certain free scholarships. It had a loose affiliation with McGill University till 1890, when it became a college of that Institution, and an attempt was made to conduct it in harmony with University ideals upon the income from the tuition paid by students; but it perished from starvation in 1903, after having exerted a highly beneficent influence upon veterinary education for thirty-seven years.

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of the New York College of Veterinary Surgeons and the American Veterinary College, is technically a part of the New York University, and some of the subjects are taught to veterinary students by the faculty of the medical and other departments of that institution. In a general way the University administers the College, but practically it remains as its two component colleges were before, a private school dependent upon the tuition for its sustenance. It may therefore be classed with the private colleges.

With these preliminary explanations we venture to submit the following tabulated statement of the Veterinary Colleges of the United States and Canada as they exist to-day, the data being based upon the announcements of the various schools which we accept as the authentic statements of the Colleges themselves and present them as such.

We have doubtless made numerous errors in our interpretation of the announcements, some of which errors may possibly be serious, in which case we shall cheerfully make amends in these pages if the affected parties will kindly advise us of our mistakes.

We have tried to reduce all questions of the amount of teaching devoted to a given branch to a common denominator in the form of the total number of hours devoted to the topic. The announcements are not always clear on these points. In those branches where a topic is taught by both lecture or class room and laboratory work, the first is indicated by the upper figures in the square and the laboratory work below, $\frac{16}{72}$ indicates that sixteen hours are devoted to lecture or classroom and seventy-two hours to laboratory work.

Generally speaking, the lecture or classroom work is considered as equalling in student effort two or three laboratory hours. We have eliminated the question of semesters or terms, and reduced all study to hours, and in these have aimed to exclude vacations and time devoted to term or final examinations, and confined our figures to *net* hours of classroom or laboratory work. Wherever it could add to the lucidity of our data we have referred throughout our table to footnotes by ( ), and in cases where the same subject is given more than one time in the same way to the student it is indicated by the number of hours the subject is given in one college year and the number of repetitions (shown by X 2 or 3) according as the subject is repeated for two or three years. Studies mentioned by the announcement as being taught but time not given, are denoted by +.

All Colleges receiving State or Governmental aid are classed together as State Colleges, while those dependent upon tuition and conducted by a private party or parties, even though technically affiliated with a University, are classed as private colleges.

References to Table of Colleges.

(1) Microscopy, histology, and embryology given consecutively as one course, and total time given to all under embryology.
(2) Each student is required to spend the vacation between the first and second years with a practitioner as a pupil.
(3) Divided equally between second, third, and fourth years.
(4) Included under hygiene.
(5) Second and third years.
(6) Included under Materia Medica.
(7) ,, ,, chemistry.
(8) ,, ,, medicine.

Name of College	Founded	Length of Course in Years	Length of College Year in Months	Number of Instructors				Entrance Requirements	Tuition	Number of Students	Degrees Conferred	Notes	Practice of Medicine	Sanitary Medicine	Military Practice	Clinical Diagnosis	Canine Pathology	Cattle Pathology
Colleges supported in part or wholly by the State or Government				Veterinarians	Physicians	Others	Total											
Ecole de Med. Comp. et de Sci. Vet., Laval University, Montreal	1886	3	8	4	3	1	8	Model School Education	(28)	13	V.M.D.	(25)	80 x3	10	...	...	...	...
New York State Veterinary College, Cornell University, Ithaca	1896	3	9	9	1	13	23	High School Graduation	Free (77)	88	D.V.M.	...	192	64	(8)	17	...	(8)
Veterinary Department, University of Pennsylvania, Philadelphia	1884	3	9	13	9	4	26	Orthography, grammar, essay, elementary physics	$100 (68)	105	V.M.D.	(79)	204	...	...	...	34	...
Veterinary Department, Ohio State University, Columbus	1890	3	9	5	5	10	20	Arithmetic, geography and grammar ...	Free	114	V.S.	(59)	180	...	...	...	60	...
Ditto	1890	3	9	5	5	10	20	English, composition, rhetoric, United States History, arithmetic, botany, physics, physical geography, Latin or German	,,	114	D.V.M.	(59)	180	...	...	..	60	...
Division of Veterinary Science, Iowa State College, Ames	1879	4	9	4	...	18	22	High School Graduation	,,	66	D.V.M.	(59)	192	144	...	16	...	...
Kansas State Agricultural College, Manhattan	1905	4	9	3	...	4	7 (70)	Grammar School Education...	,,	(81)	D.V.M.	(59) (71)	324 (72)	...	...	...	...	...
Washington State College, Pullman ...	1896	3	9	5	...	5	10	Grammar School Education and sixteen High School Credits (60)	,, (69)	20	D.V.S.	(59)	85	(63)	...	68	(65)	85 (64)
Ditto	1896	4	9	5	...	5	10	High School Graduation	Free (69)	20	B.V.S.	(59) (66)	85	(63)	..	68	(65)	85 (64)
Private Veterinary Colleges																		
Ontario Veterinary College (Limited), affiliated with Toronto University	1862	2	5½	5	3	...	8	Common School Education...	$65	272	(29)	(30) (31) (82)	...	...	...	...	...	...
New York-American Veterinary College, a college in New York University	1899 (86)	3	6	13	7	3	23	High School Graduation	100	52	D.V.S.	...	96	48	...	...	(8)	48
United States College of Veterinary Surgeons, Washington	1894	3	6	8	...	5	13	Common School Education...	100	...	D.V.S. (32), M.U.S.C.V.S. F.U.S.C.V.S.	(25)	96	24	...	...	48	24
Cincinnatti Veterinary College	1900	3	6	5	4	2	12	,, ,, ,, ...	90	(81)	D.V.S.	(31)	+	...	...	...	...	...
Indiana Veterinary College, Indianapolis	1892	3	6	6	4	3	12	,, ,, ,, ...	75	...	V.M.D.	(58)	120 (50)	...	...	...	...	96 (54)
Grand Rapids Veterinary College, Michigan	1897	3	6	7	3	4	14	,, ,, ,, ...	$85	102	D.V.S., D.V.M., M.D.C., D.D.V.S., V.D.D.S., V.S., M.F. (33).	(31)	+	...	...	...	...	...
Chicago Veterinary College	1883	3	6	11	1	3	15	,, ,, ,, ...	90	304	M.D.C.		168 (14)	...	..	..	24	48
McKillip Veterinary College, Chicago...	1892	3	6	6	4	4	14	,, ,, ,, ...	85	165	M.D.V.		96 (13)	72	...	12	24 48 (84)	48
Kansas City Veterinary College ...	1891	3	6	10	...	14	24	, ,, ,, ...	80	280	D.V.S.		72	...	48	48	...	...
College of Veterinary Science of West Virginia University, Pittsburg, (88) ...	1906	...	...	...	...	...	...	... ...	...	...	... ...	...	. .	...	...	...	...	...
Western Veterinary College, Kansas City	1897	3	6	11	4	2	17	Common School Education...	75	(81)	D.V.S.	(31)	+	+	...	...	+	+
San Francisco Veterinary College ...	1899	3	6	7	4	4	15	,, ,, ,, ...	116	(83)	D.V.S.	(31)	+	...	...	...	+	+
St. Joseph Veterinary College, St. Joseph, Missouri (88)	1905	...	...	...	...	...	...	... ...	...	...	... ...	...	...	...	...	...	...	...

rements	Tuition	Number of Students	Degrees Conferred	Notes	Practice of Medicine	Sanitary Medicine	Military Practice	Clinical Diagnosis	Canine Pathology	Cattle Pathology	Opthalmology
... ...	(28)	13	V.M.D.	(25)	80 x3	10	...	...	...	...	...
... ...	Free (77)	88	D.V.M.	...	192	64	(8)	17	...	(8)	(8)
, essay, elementary	$100 (68)	105	V.M.D.	(79)	204	...	...	...	34	...	...
nd grammar ...	Free	114	V.S.	(59)	180	...	...	...	60	...	24
toric, United States botany, physics, tin or German	,,	114	D.V.M.	(59)	180	...	...	..	60	...	24
	,,	66	D.V.M.	(59)	192	144	...	16	...	...	16
tion...	,,	(81)	D.V.M.	(59) (71)	324 (72)	...	...	...	...	...	...
cation and sixteen 60)	,, (69)	20	D.V.S.	(59)	85	(63)	...	68	(65)	85 (64)	...
n	Free (69)	20	D.V.S.	(59) (66)	85	(63)	..	68	(65)	85 (64)	17
tion...	$65	272	(29)	(30) (31) (82)	...	...	...	...	...	...	...
n	100	52	D.V.S.	...	96	48	...	...	(8)	48	24
tion...	100	...	D.V.S. (32), M.U.S.C.V.S. F.U.S.C.V.S.	(25)	96	24	...	...	48	24	..
... ...	90	(81)	D.V.S.	(31)	+	...	...	...	...	...	...
.. ..	75	...	V.M.D.	(58)	120 (50)	...	...	...	...	96 (54)	48 (56)
... ...	$85	102	D.V.S., D.V.M., M.D.C., D.D.V.S., V.D.D.S., V.S., M.F. (33).	(31)	+	...	...	...	...	...	...
... ...	90	304	M.D.C.	..	168 (14)	...	..	..	24	48	...
... ...	85	165	M.D.V.	...	96 (13)	72	...	12	24 48 (84)	48	...
... ...	80	280	D.V.S.	...	72	...	48	48	...	..	48
... ...	...	..	... ...	...	..	...	...	...	...	...	...
....	75	(81)	D.V.S.	(31)	+	+	...	...	+	+	+
... ...	116	(83)	D.V.S.	(31)	+	...	...	...	+	+	...
... .	...	...	... ...	...	...	...	...	...	...	...	...

Pathology	Cattle Pathology	Opthalmology	Hygiene	Parasitology	Total Medicine Group	Surgery	General Surgery	Operative Surgery	Castration and Spaying	Dentistry	Lameness	Horse Shoeing	Surgical Exercises	Surgical Restraint	Surgical Anatomy	Total Surgical Group	Clinics	Obstetrics	Microscopy	Histology
.	...	...	20 x3	...	110	75 x3	...	25 x3	...	...	...	10 x3	...	...	...	110	20 x3	20 x3	...	..
.	(8)	(8)	(8)	64	337	96	24	(9)	(9)	(9)	(9)	(8)	72	...	...	192	516 (5)	52	(1)	(1
4	...	...	...	...	238	150	...	180	...	...	...	34	...	...	...	404	816	34	...	..
o	...	24	...	(38)	264	144	24	..	...	...	...	36	36	...	...	240	720 (5)	60	...	30 (36
o	...	24	...	(38)	264	144	24	...	...	...	...	36	36	...	...	240	720 (5)	60	...	30 (3
.	...	16	...	...	368	192	...	180	...	...	...	32	...	...	16	420	864 (3)	36	...	3 7
.	...	...	...	(73)	324	180	..	60	...	...	...	...	...	...	60	300	(11)	60	...	12
5)	85 (64)	...	(63)	34	272	119	...	85	...	...	..	34	...	...	85	323	374 (61)	51	...	3 13
5)	85 (64)	17	(63)	34	272	136	..	85	..	...	...	34	...	...	85	340	374 (61)	51	...	3 13
.	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	..	(2)	...	..	..
)	48	24	...	...	216	72	9	(9)	(9)	(9)	(9)	24	(9)	(9)	...	96	288	72 (13)	...	48
3	24	..	...	...	212	(22)	...	...	...	24	..	...	...	...	...	24 (22)	144	48	24	(20
.	...	...	...	...	...	+	...	...	...	...	...	...	...	...	...	...	...	+	...	+
.	96 (54)	48 (56)	...	..	264	144 (42)	...	(41)	...	48	(51)	(51)	...	...	...	192	(35)	(43)	(57)	96 (48
.	...	...	+	...	...	+	..	...	...	+	...	...	..	...	...	...	+	+	...	+
4	48	...	24	..	264	120	...	...	...	24 72	48	(18)	..	...	...	192 72	216 (19)	(17)	(16)	144 192
4 3	48	...	12	...	264 48	48 (13)	24	...	...	24 48	48	(18)	...	24	...	108 48	96 (23)	...	...	48 48
4)	..	48	48	...	264	...	48	96	24	48	48	48	...	...	...	312	(85)	48	...	48
.	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
	+	+	+	...	...	+	...	+	+	+	+	+	...	...	...	...	+	+	...	+
	+	...	...	...	...	+	...	...	...	+	...	...	...	...	...	...	+	+	..	...
	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...

Ophthalmology	Hygiene	Parasitology	Total Medicine Group	Surgery	General Surgery	Operative Surgery	Castration and Spaying	Dentistry	Lameness	Horse Shoeing	Surgical Exercises	Surgical Restraint	Surgical Anatomy	Total Surgical Group	Clinics	Obstetrics	Microscopy	Histology	Bacteriology	Pathology	Meat and Milk Inspection	Dairy Inspection	Physiology	Embryology	Anatomy	Chemistry	Physiological Chemistry
...	20	...	110	75	...	25	...	...	...	10	...	...	...	110	20	20	...	...	(75)	20	...	...	60	...	65	75	...
	x3			x3		x3				x3					x3	x3				x2			x2		x3		
																							(74)				
(8)	(8)	64	337	96	24	(9)	(9)	(9)	(9)	(8)	72	...	...	192	516	52	(1)	(1)	32	80	(39)	...	96	64	80	64	...
															(5)				160	128			80	192	704	80	
																								(1)			
...	...	...	238	150	...	180	...	...	...	34	...	...	...	404	816	34	...	...	17	(80)	34	...	170	..	108	102	...
																			64	51			110		x2	(78)	
																				110					680	204	
24	...	(38)	264	144	24	..	...	...	...	36	36	...	...	240	720	60	...	306	36	84	60	..	108	24	168	48	(32
															(5)			(36)	48	219					384	144	
24	...	(38)	264	144	24	...	...	...	...	36	36	...	...	240	720	60	...	306	36	84	60	...	108	24	168	48	(32
															(5)			(30)	48	219					384	144	
16	...	...	368	192	...	180	...	...	...	32	...	...	16	420	864	36	...	36	16	144	48	.	108	32	216	72	4
															(3)			72	32	72	32			32	864	72	4
													60	300	(11)	60	...	120	30	84	60	66	120	...	90	150	...
...	...	(73)	324	180	..	60	...	...	...	...	...	...							120	48					456	96	
													85	323	374	51	...	34	34	34	85	...	170	...	102	68	...
															(61)			136	102	136	(62)				288	204	
...	(63)	34	272	119	...	85	...	...	..	34	...	...															
17	(63)	34	272	136	..	85	..	...	...	34	...	...	85	340	374	51	...	34	34	34	85	...	170	...	102	68	...
															(61)			136	102	136	(62)				288	204	
...	...	...	...	...	...	...	..	...	...	...	...	...	...	..	(2)	...	..	..	...	...	...	...	...	...	...	...	...
24	...	...	216	72	(9	(9)	(9)	(9)	(9)	24	(9)	(9)	...	96	288	72	...	48	72	72	(12)	24	48	24	156	144	...
																(13)								(13)	576	96	
													...	24	144	48	24	(20)	24	72	..	...	48	...	192	24	...
..	...	...	212	(22)	...	...	...	24	..	...	...	...		(22)													
													...	...	...	+	...	+	+	+	...	...	+	...	+	+	...
...	...	...	...	+	...	...	...	...	...	...	...	...															
													...	192	(35)	(43)	(57)	96	(49)	96	55	...	96	47	120	96	...
48	...	..	264	144	...	(41)	...	48	(51)	(51)	...	...						(48)					(46)		(40)	(44)	
36)				(42)																					312		
																									(87)		
..	+	...	...	+	..	...	...	+	...	...	..	...	...	...	+	+	...	+	+	+	...	...	+	...	+	+	...
..	24	..	264	120	...	...	...	24	48	(18)	...	...	...	192	216	(17)	(16)	144	(15)	48	48	...	72	...	96	48	...
								72						72	(19)			192		144					288	96	
								72						108	96	...	...	48	48	36	36	...	144	...	216	48	
..	12	...	264	48	24	...	...	24	48	(18)	...	24	...	48	(23)			48	48	144	36				288	120	
			48	(13)				48																			
48	48	...	264	...	48	96	24	48	48	48	...	...	...	312	(85)	48	...	48	48	48	...	...	48	...	120	72	
																									288		
..	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
+	+	...	...	+	...	+	+	+	+	+	...	...	...	...	+	+	...	+	+	+	+	...	+	..	+	+	
..	...	...	...	+	...	...	...	+	...	...	...	...	...	...	+	+	..	...	+	+	+	...	+	...	+	+	
..	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	

Anatomy	Chemistry	Physiological Chemistry	Urine Analysis	Toxicology	Poisonous Plants	Botany	Zoology	Entomology	Biology	Materia Medica	Therapeutics	Pharmacy	Language of Medicine or Pharmacy Latin	Administration of Medicines	Zootechnics	Hippology	Exterior of Horse	Feeds and Feeding	Animal Husbandry and Breeds and Breeding	Conformation and Soundness	Total Zootechnic Group	Jurisprudence	Research and Thesis	Total Hours in entire Course
65	75	...	...	...	...	...	...	...	...	50	(6)	...	...	...	25	..	20	...	...	40	85	...	...	540
x3										x3					x3		x2							(25)
										(76)														
80	64	...	60	...	...	...	...	...	...	32	17	32	...	..	12	...	(10)	...	32	(9)	44	8	240	3408
704	80									80									24		24		(34)	
108	102	...	..	..	...	68	34	...	68	68	68	(6)	...	...	34	...	...	...	...	...	34	34	...	3584
x2	(78)									102														(79)
680	204									(52)														
168	48	(37)	...	...	..	...	...	...	...	84	36	36	...	...	...	...	...	...	48	...	48	...	...	3237
384	144									48		48							24		24			
168	48	(37)	...	...	...	...	...	...	...	84	36	36	...	...	...	...	...	...	48	...	48	...	...	3237
384	144									48		48							24		24			
216	72	40	...	...	16	32	48	16	...	32	72	36	...	...	72	36	...	64	132	32	336	16	...	4704
864	72	40			32	32	32	32				72			284						284			(59)
90	150	...	..	...	..	...	...	...	...	84	...	60	...	...	...	..	...	...	90	...	90	...	60	2418
456	96																							(59)
																								(71) (24)
102	68	...	...	...	...	34	...	...	...	102	...	...	...	...	...	...	...	...	51	...	51	...	170	2940
288	204					102				68														(59)
102	68	...	6	...	...	...	...	...	...	102	...	...	51	...	...	...	...	...	51	...	51	...	170	2892
288	204		24							68														(66) (26)
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(30)
																								(31) (82)
156	144	...	...	(7)	...	..	...	...	...	72	(6)	(6)	...	(6)	(11)	...	...	...	...	...	...	(11)	...	2006
576	96																							
192	24	...	...	...	...	...	...	...	...	48	...	120	...	...	...	...	...	...	...	...	...	24	...	1004
																								(25)
+	+	...	...	...	...	+	+	...	+	+	+	...	...	...	...	...	..	...	...	...	...	...	...	(31)
120	96	...	...	(45)	...	...	...	...	...	120	(53)	(53)	...	...	...	...	...	...	...	...	...	...	...	1392
(40)	(44)									(52)														(58)
312																								
(87)																								
+	+	...	...	...	...	...	...	...	...	...	+	+	...	...	...	...	...	...	...	...	..	+	...	(31)
96	48	...	...	...	...	...	...	...	...	...	72	...	...	...	...	...	...	..	...	...	...	24	...	2016
288	96																							
216	48	...	(67)	(67)	...	...	...	...	...	72	84	24	...	...	(4)	...	...	...	...	...	...	12	...	2076
288	120																							
120	72	...	...	...	...	...	...	...	...	...	48	48	24	...	..	...	24	...	...	48	72	24	...	1512
288													(21)											(27)
...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	..	...	...	...	...
+	+	+	...	+	...	...	...	...	...	...	+	+	+	...	...	...	...	+	...	...	...	...	...	(31)
+	+	+	...	+	...	...	...	...	...	+	+	+	..	...	...	...	...	...	...	...	...	...	...	(31)
..	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

(9) Included under surgery.
(10) „ „ animal husbandry.
(11) Listed, but hours not given.
(12) Included under sanitary medicine.
(13) Repeated to second and third year men.
(14) Including parasitology.
(15) Included under pathology.
(16) „ „ histology.
(17) „ „ cattle pathology.
(18) „ „ lameness.
(19) See also dentistry, and add, therefore, seventy-two hours.
(20) Included under physiology.
(21) Etymology of medical words.
(22) Included under practice of medicine.
(23) See also canine practice, which adds forty-eight hours to clinic.
(24) To this total should be added clinics, the number of hours of which is not given.
(25) Announcement indefinite. Figures indicate number of lessons *per annum* in each subject, which appear to be repeated annually to same student. The number of times apparently repeated are indicated by X 2 or 3, indicating that students repeat the subject for two or three years respectively. In other words, it appears to be a one year course given two or three times to each student.
(26) There seems to be a discrepancy in our figures, by which the four year course is made shorter than the three year, apparently due to the presence of botany in the three year course, which we cannot find in the four year schedule.
(27) Excluding clinics, which would probably add 500 to 800 hours. See (85).
(28) The announcement is silent upon the question of tuition, and a communication addressed to the Dean upon the matter elicited no response. Because of an annual appropriation of $2,000 from the Quebec Parliament, students from the home province are said to be relieved from paying tuition. The instruction is given in French, and since Quebec (originally a French province) is virtually the only section in North America where the French language continues in general use, it is probable that scarcely any students pay tuition.
(29) A certificate of graduation or diploma is issued, which, though not directly conferring a degree, is regarded as being equivalent to that of V.S., which title is commonly used by the *alumni*.
(30) Data taken from announcement for 1905-6.
(31) No definite curriculum given in the announcement nor the number of hours devoted to any subject. Subjects announced as taught are marked +.
(32) Doctor of Veterinary Science, Member of the United States College of Veterinary Surgeons and Fellow of the United States College of Veterinary Surgeons respectively.
(33) Doctor of Veterinary Science, Doctor of Veterinary Medicine, Doctor of Comparative Medicine, Doctor of Dental Veterinary Science, Veterinary Doctor of Dental Surgery, Veterinary Surgeon and Master Farrier respectively.
(34) Thesis adds the number of hours of actual work upon that topic which the student may elect as a subject.
(35) Included under anatomy (dissection).
(36) Includes physiological chemistry and urinalysis.
(37) See histology.
(38) Included under medicine.
(39) „ „ pathology.
(40) Includes operative surgery.
(41) See anatomy.
(42) Includes obstetrics.
(43) See surgery.
(44) Includes toxicology.
(45) See chemistry.
(46) Includes embryology.
(47) See physiology.
(48) Includes bacteriology.
(49) See histology.
(50) Includes practice of equine medicine, lameness, shoeing, and examination for soundness.
(51) See practice of medicine.

(52) Includes pharmacy and therapeutics.
(53) See Materia Medica.
(54) Includes meat and milk inspection.
(55) See cattle pathology.
(56) Includes microscopy.
(57) See opthalmology.
(58) Official schedule shows a large part of studies given to second and third, or to all three classes, approaching a one year curriculum given three times to each student in three successive years. Possibly anatomy should be multiplied by three, less the time devoted to clinic.
(59) Supported in part by the "Morill Fund," appropriated by the United States Government for the establishment of State and territorial colleges for the teaching, among other studies, of agriculture, mechanics, arts, and military science. Veterinary students in these colleges are required to take military drill in addition to veterinary studies.
(60) A high school credit is defined as a forty-five minute recitation five times a week for eighteen weeks (one semester). Sixteen counts are equivalent to approximately two years of high school work.
(61) Figures according to schedule for 1906-7. According to the "Report of the American Veterinary Medical Association of 1905," p. 150, this should be increased by 50 per cent. The discrepancy may be due to the clinic period being three hours, whereas the announcement defines a credit as two hours of laboratory work.
(62) Includes sanitation and hygiene.
(63) See meat and milk inspection.
(64) Including canine practice.
(65) See cattle pathology.
(66) Includes also United States history, 85 hours; rhetoric and composition, 85; advanced geometry, 34; trigonometry, 51; German, 289; English literature, 85.
(67) Included under chemistry.
(68) Twelve free scholarships are granted by the State, and the University of Pennsylvania grants fifty scholarships to students from Philadelphia public schools in order of merit, and may be used in veterinary or other colleges of the University.
(69) Non-residents pay $20 tuition.
(70) This does not include the teachers of subjects in the general college courses having no direct relation to veterinary science.
(71) No veterinary studies proper are pursued during the freshman year, but the time is devoted to academic studies such as count for admission in some other colleges, and during the last three years still other academic subjects are scattered among those which are strictly professional.
For the four years they are as follows, expressed in hours:—Geometry, 120; algebra, 60; English, 320; psychology, 12; physics, 60; drawing, 96; botany, 60; mechanics, 132; agriculture, 60; public speaking, 60; civics, 60; American history, 60; economics, 60; European history, 60. Total, 1,264 hours.
(72) Includes parasitology and other of medicine group and lameness.
(73) Included under medicine.
(74) Includes bacteriology and chemistry.
(75) Included under physiology.
(76) Includes therapeutics.
(77) Non-residents pay $100 tuition. Each student pays about $30 per annum laboratory fees for material used.
(78) Includes physiological chemistry.
(79) Two hours per week throughout the course are required in physical training in the gymnasium.
(80) Includes pathologic histology and morbid anatomy.
(81) Lists of students not given.
(82) Figures for 1905.
(83) Data taken from 1904 announcement.
(84) The forty-eight hours are for canine clinic, which might have been properly added to the clinic column.
(85) Schedule not given in announcement, but states: "The daily clinical lectures are open to all the classes." If two hours daily, this would make about 864 hours.
(86) Formed by the union of the New York College of Veterinary Surgeons and American Veterinary College.
(87) Includes clinics.
(88) Neither announcements or other official data secured.

A critical study of the foregoing tabulated data reveals much of interest, and affords a comparatively reliable index as to the actual work being done. In case of some of the Colleges accurate information is wanting in many respects, but even their absence throws a reflected light upon the institutions and brings out some salient features.

Referring to this table our attention is first attracted to the grouping of the colleges into "State" and "Private" and their nomenclature.

In the State group, aside from Laval and Pennsylvania Universities the Colleges are purely State in character. The New York State Veterinary College is supported directly by State appropriations, while the others receive monies through the basic institution of which they form a part, from the U.S. Government by its appropriations to Agricultural Colleges and additional funds from the states themselves.

Laval and Pennsylvania Universities are endowed Institutions, to the former of which the provincial government grants an annual stipend of $2,000 for sustenance, and to the latter the State of Pennsylvania makes occasional appropriations, the last legislature granting $100,000 for the erection of veterinary buildings.

Aside from Laval and Pennsylvania the names of each college in this group is clearly indicative of its governmental character, but no suggestion of location is included in the name beyond the state which supports or administers it.

Turning to the private colleges it is seen at a glance that the motives of nomenclature are varied and present some items of interest.

The Ontario Veterinary College and the United States College of Veterinary Surgeons might suggest governmental support or control, and thereby lead to error. The naming of the United States College of Veterinary Surgeons offered a problem in nomenclature. Located at the national capitol in the City of Washington and District of Columbia, it is difficult to find a name for a private veterinary college which may not be more or less objectionable to Americans. One private veterinary college, now defunct, located at the national capitol, took upon itself the name of "National Veterinary College."

There is growing sentiment in the United States against the appropriation by a private party or corporation of the name United States, National, or American, as a trade-mark, or of using the national emblem for advertising purposes, though until within comparatively recent years the practice has been common. At home this method of nomenclature occasions little or no confusion.

The other colleges in this group generally bear names indicative of the city in which they are located, except where a city contains more than one college; in this case the primary one tends to appropriate the City name, and those following need resort to other expedients. Thus in Chicago, the second college in date of organisation took the name of its proprietor and head (McKillip), and in Kansas City there was organized the "Western Veterinary College."

The institution at Indianapolis adopts the name of the state, Indiana, in preference to that of the city, but carries in its title no strong suggestion of being a State School.

In the length of the college course it becomes apparent that the State Colleges maintain a marked lead; the shortest course, Laval, among the State Colleges, exceeding the longest course offered by a private institution; and even Laval is placed in the State group upon

the technicality of receiving the insignificant annual allowance from the Government of $2,000.

The other colleges in the State group maintain courses of at least three years of nine months each, or a total of 27 months, while three of them have advanced to four years of nine months each, or a total of 36 months, although, save in the case of the Iowa State College, the actual amount of veterinary instruction given does not exceed that in the 27 months of the other schools, as is indicated in the final column of the above table.

Among the private Colleges the length of course is uniformly three years of six months each, or a total of 18 months. In the case of the Ontario Veterinary College, the oldest on the continent, there is also added pupilage with a practitioner (during the summer vacation) of possibly six months. Pupilage with a practitioner is not required compulsorily by any other American Veterinary College.

The number of veterinarians engaged in teaching in the various schools differs widely. In the State Colleges the faculties average small in veterinarians with the exception of Pennsylvania. The difference in numbers arises largely from the fact that in the State Colleges, except Pennsylvania and Laval, the teachers are on full professional salaries, and their entire time is devoted to College work, while in the private schools each instructor devotes but a fragment of his time to college work, and receives his chief income from practice or other pursuits.

In the private College a member of the faculty earning his livelihood chiefly from private practice is limited in the amount of time which he can devote to college instruction, or he teaches a subject limited in its scope, and so in these the schedule of a Professor may drop to 24 hours, or even less, per annum, or mount in some of the State Colleges as high as 800 to 1,000 hours in a year. Between these extremes every gradation is found. In itself the number of instructors in a faculty constitutes a poor index to the amount or quality of the instruction given.

But the number of instructors is not devoid of significance, if the environment is considered. The greater the number in a faculty, the larger the possibility of having each topic or division of a subject taught by a specialist in that line, but a long list of instructors does not necessarily establish the existence of an equally long list of capable specialists, nor does it follow that a Faculty composed of but few persons is inefficient in its instructing power. The specialist, by teaching but one subject, may become injuriously narrow, while the general teacher may push the broadening process so far as to become shallow.

An important phase in the question is the source of knowledge which the instructor has to impart, whether it comes from books or personal experience, or both.

Excluding Laval and Pennsylvania the State group of Colleges has a body of teachers who, while quite uniformly enjoying high academic and technical education, are generally devoid of experience as private practitioners. The writer knows of but one teacher in this group who has had five or more years of active private practice as a veterinarian. On the other hand, in Laval, Pennsylvania, and the group of private Colleges, practically each instructor engaged in teaching a strictly

applied veterinary branch is actively engaged in private practice as his chief source of sustenance.

The teachers in the State Colleges are largely confined to the college clinics for their personal experience, but this is supplemented frequently by a limited amount of private practice, conducted at occasional hours when they can escape from college duties.

The locations of the individual Colleges affect the opportunity for personal experience both in quantity and diversity. The purely State Colleges are largely located with the State Agricultural Colleges, which are quite uniformly in purely agricultural communities, the chief exception being the Ohio State University located in a city of the second magnitude with a rich livestock country immediately around it, while Laval, Pennsylvania and the private group are largely situated in cities of the first magnitude. The large cities afford opportunities to the members of veterinary faculties to enter actively into private practice so long as their College duties do not interfere, while in the rural communities such opportunity is limited. The Rural Colleges can command for their clinics a limited number of all species and ages of domestic animals, whether used for breeding, labour, pleasure, meat or milk production, while the City College has access to a more voluminous clinic consisting chiefly of adult horses, dogs and cats, with possibilities always for drawing agricultural cases from contiguous territory. Each type of College has its excellencies and defects, and the chief criticism in this respect is that they are independent of each other and do not afford the mutual support and strength which they should. The gulf between the two types will be bridged when a state or endowed college is so established that it will offer opportunity, either in the college clinic or private practice, to a large staff of teachers for abundant and effective personal experience, with salaries which shall render each independent of the cares incident to earning a livelihood.

The present salaries in the State Colleges range from $1,000 to $4,000 per annum, with provision for retirement upon pension, under the Carnegie Fund, either from age or disability, and a widows' pension in case of death. Under such conditions the teacher is in a position to devote his whole time to his teaching and to throw all his energy and enthusiasm into his work. This does not bar him from acquiring personal experience, but should lead him to seek it all the more earnestly, with the sole object of increasing his ability to impart knowledge to others. The general trend of veterinary education in America is towards the State College, or its equivalent, the endowed institution, and one of the most encouraging developments in the whole history of veterinary education in this country was the appropriation of $100,000 by the last Pennsylvania Legislature for the Veterinary Department of the University of Pennsylvania. This institution has met many discouragements, including fire, and has been obliged to subsist upon a precarious income in well nigh uninhabitable quarters; but the action of the State in extending definite and liberal aid not only gives promise of future support, but, far more, points to a solution of the whole problem by suggesting the ultimate support and control of many of the worthier private colleges by the states. In noting the extent of tuition in the various colleges it will be seen that those conducted by the states are free, whilst in

the private college the average annual tuition is less than 100 dols., and necessarily the instruction must cost no more.

The cost of instruction in State Colleges per student is very much higher than the highest tuition paid in any college. We have no definite data of the cost of instruction per student. On p. 149 of the "Proceedings of the American Veterinary Medical Association," for 1905, Dean Pearson estimates the cost of a student in the Pennsylvania College at $350 per annum, and regrets that he has no more to expend. In the New York State Veterinary College the annual maintenance appropriation is $25,000, some of which is expended in investigation work. During its ten years the highest number of students registered was 108, which reduced the *per capita* expense below $250, but with an enrolment of eighty-eight last year the expense mounted to $281, which is far below the average annual expenditure per student. As Dr. Pearson states, such amounts are inadequate, but the private, unendowed colleges cannot expend such sums and must continue to do the best they can under their surroundings.

In buildings and equipment for instruction the State Colleges naturally lead.

The New York State Veterinary College leads the group with buildings which cost, in 1896, $150,000, to which material additions have been made in equipment and somewhat to the buildings. In addition, the late Governor Flower donated $5,000 for a veterinary library (Cornell University already having a very extensive collection in its general library), and to this was later added by Mrs. Flower an endowment of $10,000, which furnishes an annual income of about $500 for veterinary books and journals.

Ohio probably comes next in equipment, followed closely, or possibly excelled, by Iowa.

Pennsylvania, when first organised, had the best buildings in America, but these were razed some years ago to make room for other structures, since which the school has been badly housed, but plans are completed for a structure to cost $330,000, and the contract has been made for the immediate construction of a part of it, to cost $110,000. We are assured that the other portions will also be pushed to completion without material delay. The completion of this will restore Pennsylvania to her former place of precedence in equipment in America.

Among the private colleges we have failed to secure any considerable data, but are able to submit some estimates. The Ontario College probably stands well in the front, but we have no data. The cost of building and equipment of the McKillip College is about $70,000, excluding grounds, the Kansas City College building and equipment are valued at $60,000, the Chicago Veterinary College probably ranks next, and from these downwards there is every gradation.

In comparing the building and equipments of State and private colleges, it is to be borne in mind that while the former are used exclusively for college purposes the latter are used jointly for college and private ends, including office, hospital and stable accommodation, for the private practice of the officers and proprietors, and, in fact, in some cases, the office, stables, &c., of a private practitioner have become the college buildings without essential change, beyond placing

benches for students in an upstairs room; but, in most cases, the buildings have been constructed for college purposes, and are as well suited for that object as their cost could command.

In some cases the equipment throws a strong light upon the character of the college itself, especially when detailed plans of arrangement are shown.

The Indiana Veterinary College, on p. 7 of its announcement, submits a unique ground plan of its establishment. A patient entering the clinical and operating room needs pass through the adjoining dissection room, and after an operation he may be in whole or part transferred into the adjoining museum or dissecting room, or through the latter into the hospital, as the exigencies of the case may dictate.

In some of the institutions the teaching work is made quite secondary to private practice. For example, we might take the schedule of the United States College of Veterinary Surgeons, in which the students are expected to do their clinical work by observing and aiding in the hospital work of the proprietor of the college from 8 to 10 a.m., and then go to the dissecting room while the practitioners of the teaching staff make their professional visits, and these being finished, instruction is resumed at 5 p.m., and the chief class work carried out after 6 p.m. It is by no means alone in this respect, but if unofficial information is to be trusted, several colleges do virtually all their teaching, except the clinical instruction afforded by the practice of the staff, after the shades of night have virtually brought practice to a close and constituting what we might denominate night or "moonshine" colleges.

These are naturally confined to the strictly private colleges, but does not include all of them by any means, the Chicago and McKillip Colleges and others standing conspicuously as daylight institutions. There are two points of view from which to look upon the time of day in which to give instruction. Some think that directly it can make little or no difference in the efficiency of instruction whether given at 9 a.m or 9 p.m. It will depend largely upon the vigour and freshness of teacher and student at the time when the instruction is undertaken. If the teacher is better able to instruct with equanimity and force after he has laid aside the burdens of private practice for the day, then, from his standpoint, it is the better hour.

To the student who is simply a student, some may claim that it makes little difference. But some of the students who attend night colleges perform full duties during the day at some vocation in which they earn a livelihood for themselves and perhaps a family, and except for evening lectures, could not afford the veterinary course. In the regular day schools, both State and private, poor young men frequently earn much, or all, of their expenses.

The question is—can a man simultaneously and successfully pursue a course of professional study and at the same time perform a full day's labour? It will vary with individuals. While there are some arguments in favour of night veterinary schools, it seems to us that it should be constantly recognised that the average man cannot properly accomplish two full days' work in each twenty-four hours over a long period of time, and that the ordinary veterinary student cannot regularly accomplish a full day's work in a remunerative occupation, and at the same time do justice to a course in veterinary science

adjusted to the capacities of the regular student who can devote essentially all his time to study. If these night students were required to pursue their course of study over a greater number of years it might alter the conditions.

In entrance requirements there are marked differences between the State and private groups of colleges, with the exception of the New York American School, which has its matriculation fixed by the State of New York, and in that respect becomes transferable into the State group. In the case of Laval the requirements for entrance are not clear to the writer and may mean much or little.

The New York statutes do not explicitly demand "high school graduation" as stated in the table, but rather its equivalent in what is known as the "regents counts" or credits given by the State educational department for the studies effectively pursued in the high schools. Approximately a "regents count" is equal to a forty-five minute recitation once a week for twenty weeks, and sixty of these credits, in any high school subjects, will admit to a Veterinary College in the State of New York, but may not graduate a student from a high school except these counts include certain specified subjects. In the State group (and including the New York American School) there is a variation in the entrance requirements from the lowest to the highest, of four years of high school work, some of the schools remedying the low entrance requirements by mingling academic studies with the professional work.

Except the New York American Veterinary Colleges, all schools classed as private, demand by their announcements "a common school education" for entrance. The term may mean anything except high school education, and is variously interpreted by the different schools.

A majority of the schools insist upon a moderate knowledge of the common branches, but in a few cases the announcements themselves indicate that the heads and proprietors of the colleges are lacking in an ordinary knowledge of English grammar or orthography, and could but poorly judge of the scholastic knowledge of applicants for admission.

There is a strong upward tendency in reference to matriculation requirements, and the owners of private colleges are learning by experience, that it does not pay to graduate men deficient in the rudiments of English education, and the evil is remedying itself in a great measure.

American veterinary degrees are a study and in themselves a nonentity. They acquire a meaning only when coupled with the name of the college and its individual character is known.

The ingenuity of College officers and proprietors has apparently been well-nigh exhausted in formulating degrees, but each year or two some college comes forward with something new and supposedly more attractive.

Recently the Washington State College has granted the degree of Bachelor of Veterinary Science, which we believe was also granted a few times in the early history of Cornell University. It is the only veterinary degree granted in America which assumes any academic significance.

The ordinary Doctorate as applied to veterinary medicine in

America has no academic significance, is not preceded by the Bachelor or Master degree, and does not assure even a primary education such as is provided in our most elementary schools.

The Doctorate degree in American Veterinary Colleges is the insignia of graduation from a Veterinary College and amounts to a statement by the officers or proprietors of a College to the effect that the recipient is, in their judgment, competent to practise as a veterinarian, ready to "doctor" animals, and hence a Doctor of Veterinary Science. The more advanced Colleges strive to dignify the degree with a serious meaning. From these to the lowest colleges there is a somewhat gradual descent until, finally, we pass beyond "legally organised" Veterinary Colleges to several concerns existing in Canada and the United States as "Correspondence Schools of Veterinary Science." These issue "attractive and stylish" diplomas without the formality of entrance examination, attendance, or study, for a stipulated fee, and the shock is not so great as it would be were all Colleges on the same advanced plane.

In the column of our table showing the degrees conferred the reader's attention will necessarily be attracted to the Ontario, United States and Grand Rapids Colleges.

The Ontario college (as stated under Note 29) technically confers no degree whatever, but by a well-nigh universal custom, extending over a period of forty-four years, the graduates attach the letters V.S. to their names, and, like all veterinarians in America, whether graduates of schools or not, are quite uniformly addressed as "Doctor," instead of "Mr."

In the United States College of Veterinary Surgeons the honorary degrees of Member or Fellow of the United States College of Veterinary Surgeons suggest an imitation of the Royal College of Veterinary Surgeons, and reveals therein possible advantages in their names which suggest to the stranger a national character.

In the announcement of the Grand Rapids Veterinary College for 1896-7, we fail to discover any statement as to what constitutes the official degree or degrees, but upon examining the list of graduates included we find that each has one to several degrees attached to his name. Assuming that they are not all post-graduates, we are forced to the conclusion that the degrees affixed were obtained in that institution, an opinion strengthened by the comparative rarity of some of them. We have consequently gone through the list of graduates and tried to copy therefrom all the degrees which had apparently been obtained in that school. We are unable to state from the announcement whether the candidate can take his choice from among this list, or even if his choice is limited to the list here given.

In scanning the list of graduates our attention is arrested at the following: "Baker, F. J., M.F., Brasher Falls, New York, 1904." Turning to page 30 of the same announcement we find that the course leading to this degree extends from October to December, inclusive. Unless we are seriously in error, F. J. Baker, of Brasher Falls, New York, was registered as a student in regular attendance at the New York State Veterinary College and a member of the writers' classes during the college year of 1903-4 and the first half of the year 1904-5. This would suggest possible inaccuracy in the announcement and the possibility that some of the degrees we have recorded were due to oversight or typographical error.

Coming to the courses of study in the various colleges, our table exhibits graphically the wide divergence of plan and volume of instruction officially announced by the various schools.

The divisions and combinations of subjects are perplexing in the extreme. To overcome these variations we have classified some subjects, after detailing each study individually, such as the Medicine, Surgery and Zootechnic groups, but even then the table cannot be made exact, and we have resorted to abundant footnotes in order to make the figures intelligible; try as we will, numerous errors are inevitable, and we only hope that the readers will accept our effort for the accomplishment, and, as previously stated, we shall be glad to correct any material error if interested or aggrieved readers will kindly notify us.

Taking the medicine group we find the number of study hours as mentioned in the State group of Colleges to be led by Iowa with 368, and at the other extreme, Laval with 110, hours (probably erroneous), which is in all probability greater than several of the private colleges which do not announce their courses.

In the surgical group Pennsylvania takes a prominent place, excelling among the three-year schools, and surpassed but a trifle by the four-year school of Iowa.

It is to be assumed that each subject listed in the two foregoing groups as being taught in any one college is also taught, in one way or another, in all the others, and the apparent presence of a subject in the course of one college and its absence in another is of little or no significance as a rule.

Possibly an exception should be made of Dentistry in the Surgical Group. It will be noted that it is not listed in the group of State Colleges, but assumes some prominence in the private schools, although probably as much or even more professional dentistry is taught in the State group. If we study carefully the announcements of some of these Colleges, it will be seen that the proprietors use this subject as a "leader" in advertising and enter into spirited rivalry for first place.

The Chicago Veterinary College emphasises its course in Dentistry, and states "even the freshmen are obliged practically to take advantage of the clinic, so that during the first session they become expert in handling the horse's mouth" (page 16, announcement 1906-7).

The Indiana College occupies considerable space with its dentistry course on p. 15 of its 1906-7 announcement, and does what lies within its power to show that it is rendering a great service in bringing forward a *neglected* branch of Veterinary Surgery. In the prospectus we read as follows: "There are few branches of veterinary surgery that are more important to the general practitioner than dental surgery, and in the past it has been neglected to a great degree by the veterinary colleges of the country. The public is beginning to understand its importance. The blush has come to many veterinarians when called upon to do some dental operation. He clearly demonstrated to his clients that he knew nothing about the mode and method of dental operations."

The San Francisco school has so perfected its course in Dentistry, according to its 1904 announcement, p. 26, that their studies "have been supplemented by the most extensive series of dental clinics ever undertaken by a veterinary college," and the methods of teaching are so

perfect that there is "no room for improvement." There is almost a conflict here with the McKillip College which, along with other dental studies (announcement 1906-7, p. 25), gives "the most extensive series of dental exercises ever undertaken by any veterinary college in existence."

But in our judgment the claim of the Western Veterinary College is entitled to the palm. On p. 10 of its 1906-7 announcement it asserts: "Our students, after they have attended one term, are able to perform any of the operations of veterinary dentistry."

On p. 12 they add: "A certificate of attendance is given to every student who takes the yearly examinations at the end of the session. This certificate is very nicely gotten up, and lithographed on heavy parchment paper for framing, and is the same size and style as the college diploma."

"*Very nicely gotten up*"—"*suitable for framing*"—"*not readily distinguishable from the college diploma.*"

Is this a quack veterinary dentist sent out with a testimonial which will be accepted as a diploma? Other important achievements are advertised early in the course in surgery in this college, such, for example, as cryptorchid castration, which is a roseate goal to certain classes of American veterinary students. The announcement says: "Our students are taught to castrate ridglings the first term in college."

The rivalry exhibited between Colleges throws some strong sidelights upon the ethical ideals of some parts of the veterinary profession in America. The advertising methods of the State Colleges and of the New York American College, which is administered by a highly reputable University, naturally conform to the general tone of the Universities of which they constitute component parts, and a goodly proportion of the private colleges keep themselves fairly within bounds. Generally speaking, it may be said that the claims in words made by the various College announcements are in inverse proportion to the exhibit found in the above table made from the figures taken from the same source. The Ontario Veterinary College avoids a detailed schedule of studies lest it "mistify the prospective student," and states that in its two terms of five and a half months each "the subjects taught are the same as in the modern European colleges, and all the lectures are delivered specially to veterinary students, the same as in the colleges of London, Edinburgh and Paris."

The Chicago Veterinary College claims to be "recognised as the foremost veterinary teaching institution in this country." "The system of teaching and handling of clinics are features that are at once original and unique, and are confined entirely to this institution." "Its diploma is recognised as qualifying its holder to practise in every State in the Union." This last is incorrect as applied to New York State, and probably others.

The United States College of Veterinary Surgeons claims "we have the best location for a Veterinary College in the finest city in the Union, and that our Faculty is excelled by none."

The Western Veterinary College claims that its students "have access to the largest stockyards and packing houses in the world, and, as there are more horses and mules handled in Kansas City than any

other city in America, they are enabled to see more sick and injured animals than at any other place."

The San Francisco College claims "by far the most systematised and extensive methods of practical instruction in all departments of any college in America," and has "the largest veterinary practice west of Chicago." The announcement is profusely illustrated.

In the announcement of the McKillip College the photograph of the owner serves as frontispiece, and is profusely illustrated throughout. In noting special features, under the head of "Surgery," it is stated: "Dr. M. H. McKillip, professor of this department, is one of the most distinguished surgeons in this country. For a quarter of a century the Doctor, endowed with a genius for surgery, has, by logical reasoning and business fidelity, evolutionised and created the largest veterinary clinic in the world."

The Grand Rapids' announcement opens with an imposing illustration of its "Veterinary Dental and Farrier College," and is closely followed by numerous other illustrations of the activities of the college, including the proprietor, whose picture occurs eleven times, viz., standing erect, bent, kneeling in frock coat, shirt sleeves, overalls, views! It says: "Our veterinary hospital, second to none . . . has wearing silk hat, skull cap, and bareheaded, left, right, front and rear one of the finest veterinary ambulances in the State. . . . Clinical work or actual demonstrations upon living animals at the Grand Rapids Veterinary College is second to none. This may seem a sweeping statement, nevertheless it is a fact, acknowledged by eminent men who are familiar with the work as conducted in some of the leading European and other foreign colleges, as well as those of the United States."

The attempt to draw students does not cease with claims of facilities, &c., for instruction, in case of the Western Veterinary College, but the announcement for which we applied contained the following offer:—

$1.00 KANSAS CITY, MO. No. 3,290.

THE WESTERN VETERINARY COLLEGE,
1121-1123 Holmes Street,

Will allow Dr. W. L. Willlams, $1.00 (one and no hundredth dollars). To apply on his tuition in the Western Veterinary College on receipt of twenty-five names of young men that he thinks are interested somewhat in veterinary surgery. Also a commission of five dollars for each one of these who attend this college next term.

WESTERN VETERINARY COLLEGE,
Return this with names. J. H. WATTLES, *President.*

These samples of advertising and methods of drawing students are submitted without comment or criticism, except to say that they do not represent the veterinary colleges or profession of America, but each of the data applies simply to the one college from which it emanates.

The aims and ideals of the various colleges are as heterogeneous as the schools themselves.

In the State College group having university ideals there is a general attempt to give a broad and liberal technical training which may fit the graduate for practice, sanitary control work, investigation of animal diseases, inspection of meats, army veterinary service, or any

other line of veterinary activity. The stress laid upon these various lines of work varies with the different Colleges, though there is no expressed official advice or counsel to the student as to what line of work he should pursue after graduation, and the State College imposes no obligation upon the graduate in reference to future service.

In mentioning the openings for veterinarians, the Ohio College suggests Inspector in the Bureau of Animal Industry, Instructor in Agricultural or State Veterinary Colleges, Investigator of Contagious Diseases, Cavalry Service, State and Municipal Veterinarian, stock farm manager, and general practice. Later, in stating the objects of the College, the order is changed and is made respectively practice, civil service and research work.

Pennsylvania "aims to provide a thorough education in all that pertains to Veterinary Medicine," without suggesting any special lines of activity.

In the legislative act founding the New York State Veterinary College its objects are named respectively as, investigations of animal diseases, the study of the economics of live stock breeding, the preparation of antitoxins, &c., and educating students for general practice.

In an appendix (A) suggesting openings for veterinarians in America, we find the order of mention to be United States Army Service, civil service in the United States Bureau of Animal Industry, State and municipal service, expert animal pathologists, teaching and private practice respectively.

The private colleges, virtually without exception, place great stress upon private practice, but incidentally give separate or side courses upon meat inspection or other special lines.

We have been unable to gather statistics from all the various colleges as to the result of their work as indicated by the vocation of graduates, except in a few instances, which we submit in the following table:—

TABLE SHOWING THE PERCENTAGE OF ALUMNI ENGAGED IN DIFFERENT LINES OF WORK.

College	Number of Alumni	Practice	Bureau of Animal Industry; Sanitary Work	Teachers and Investigators	United States Army	Deceased and Miscellaneous
Laval University	112	—	—	—	—	—
New York State	117	50	24	16	4	5
Ohio	109	50	40	7	1	2
Iowa	144	—	—	—	—	—
Washington	8	87	13	—	—	—
Ontario	2,899	—	—	—	—	—
United States College of Veterinary Surgeons	60	—	—	—	—	—
Cincinnatti	28	36	53	11	—	—
Indiana	120	—	—	—	—	—
Grand Rapids...	199	—	—	—	—	—
Chicago..	960	87	7	1	1	4
McKillip	225	—	—	—	—	—
Kansas City	283	69	27	1	2	1
Western	155	—	—	—	—	—
San Francisco	23	—	—	—	—	—

In the foregoing summary we have endeavoured to be frank, and to so present the conditions of veterinary education that readers, without personal knowledge, might get a comprehensive idea of our Colleges and their work. It is impossible for any one engaged in veterinary teaching in America to be free from prejudices, and it is doubtful if any one could write upon the subject without exposing these. We have endeavoured to avoid bias and done the best we could. We have aimed to show alike the best and the worst, not excluding the mediocre in our schools.

Naturally the worst stands out in boldest relief and will tend to give the reader a too pessimistic view of the problem.

We cannot copy in full the announcements of the long list of veterinary colleges in the columns of the JOURNAL, nor if we could do so, would the reading of them give a comprehensive idea of the schools, except by long and patient study, which the average reader could ill afford.

Some readers will doubtless regard American veterinary education as being in a chaotic state, but such a conclusion is not warranted from our point of view. The foreign reader must constantly bear in mind certain of our conditions.

First, the central government conducts no Veterinary Schools and exerts no direct control over their management.

Secondly, the various States and Provinces generally charter veterinary schools upon similar terms to mercantile or other corporations, and exercise virtually no control over their acts.

On the other hand, there exist, or are rapidly developing, influential corrective and controlling forces, the chief of which are as follows:—

(1) The enormous increase of agricultural wealth during the past few years, with the increased number and individual value of domestic animals, has intensified the necessity for effective veterinary service. The same wealth has given an impetus to agricultural education and the development of scientific agriculture almost beyond conception. The American stockowner and breeder of to-day is a man of vigour, education, and wealth, and appreciates the educated and efficient veterinarian.

(2) The State of New York has enacted laws dictating that before one can legally practise veterinary science he must have completed four years of high school work before entering a veterinary college, must have studied successfully in an approved college for three years, and must then pass an examination before a State Board of Veterinary Examiners.

(3) Other States and Provinces have enacted laws, fixing a minimum of education, and establishing a State Examination for licence to practise.

(4) The United States Bureau of Animal Industry, which gives civil service employment to a large body of veterinarians, requires not less than three years' veterinary education of candidates, who are required to pass a civil service examination in academic and professional studies before becoming eligible for appointment.

(5) The United States Army has adopted educational regulations for entering the service, these being fully as strict as those of the Bureau of Animal Industry.

(6) Public opinion demands better work of the Schools. The

poorer schools in general do not have the greatest numbers of students, they draw them from the lower walks of life with the poorest preparatory education and the lowest character. They drift, after graduation, to the slums in cities and to the poorer parts of the country, and reflect very little credit on the profession at large.

The best and brightest students select the best schools in the State or private groups and make good use of the opportunities before them. The good student becomes a valuable alumnus who builds up the college, the poor student drags it down and causes it to decay.

(7) The American Veterinary Medical Association, including some six hundred of the most progressive men in the United States and Canada, is exerting a powerful influence. College officers are anxious that their alumni shall be admitted, but the Association bars a number of them and shows a constant tendency to increase its power and make its membership more honourable and valuable.

It now requires that the School from which a candidate comes shall maintain a graded course of not less than three years of six or more months each, the School as a whole to be approved by the Association and the individual applicant to be approved personally.

Further stringency is contemplated and will doubtless soon be realised. Some marked advances could be readily made at once, for example:—

(1) It could readily demand a day course in all schools to be recognised by it, or otherwise correct any evils due to the giving of most of the instruction by night.

(2) It could demand that a candidate should come from a school having a clear, explicit official schedule of graded studies which will guarantee required instruction of not less than 2,000 hours of unrepeated instruction during the course, and gradually advance the number of required hours from time to time.

(3) It can keep a check upon the good faith of the schools by official visitations and by prescribing examinations for admission to the Society.

In these and other ways it can make its membership more honourable and increase the desire of veterinarians to enter its portals.

On the whole, American veterinary schools are young, have inadequate financial support, are defective in teaching capacity, and have upon their outskirts many disagreeable features; but after all they are, as a whole, vigorous, and are rapidly acquiring higher efficiency, technically and ethically. The State is becoming concerned in their welfare, and the American public is beginning to appreciate the profession and to exercise a clear conception between a veterinary education and a veterinary college diploma.

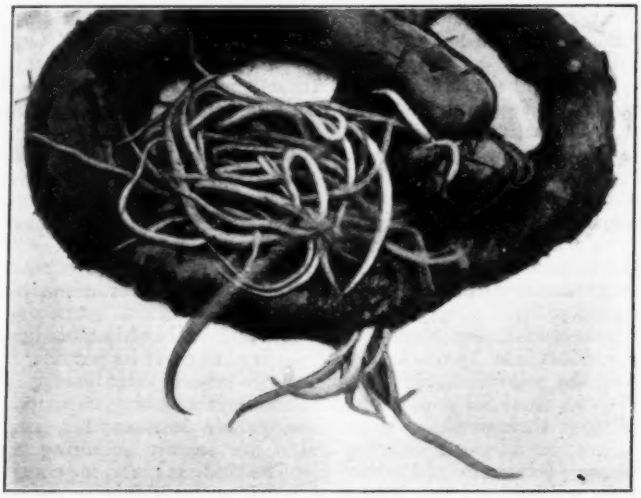
Clinical Articles.

PERFORATION OF THE SMALL INTESTINE, CAUSED BY THE ASCARIS MEGALOCEPHALA.

BY A. E. METTAM, B.SC. M.R.C.V.S., PRINCIPAL OF THE ROYAL VETERINARY COLLEGE OF IRELAND, DUBLIN.

THE specimen, of which I give a photograph, was sent to me by Mr. John Holland, M.R.C.V.S., of Athy, co. Kildare, and I cannot do better than give the history as he has given it to me. The specimen was taken from a filly foal five months old. The day before she was observed ill she had been taken from her dam to be weaned and had been placed along with another foal, also being weaned, in a loose box. Nothing had been noticed up to this time to indicate anything abnormal. She was restless and uneasy, but only consequent to separation from the dam.

The day of her death she was found, early in the morning, lying down and sweating profusely. When lifted up she staggered and



Ascarides causing Rupture of the Small Intestine.

walked with difficulty. When the patient was seen by Mr. Holland, she was standing listlessly and breathing heavily, but he satisfied himself that the lungs were not the seat of the trouble. The temperature was 102° F., the heart beats rapid but regular, the pulse almost imperceptible. The abdomen was distended and somewhat pendulous, but on questioning the owner, the latter condition was said to be normal to the filly.

The patient lived about four hours after Mr. Holland first saw it, taking no notice of the foal with it, which fruitlessly endeavoured to

attract its attention. A diagnosis of rupture of the bowel was made, the cause being assigned to the animal climbing up the wall and falling backwards.

Ten minutes before death the patient lay down, struggled violently, and roared out in pain.

A *post-mortem* examination was made immediately. The contents of the thorax were found to be quite normal. On opening the abdomen a quantity of ingesta was found free in the cavity, and turning over the intestines the rupture was readily discovered. Some ascarides had passed through the opening and were in the peritoneal cavity (these are shown lying free in the photograph), others are observed passing through the aperture in the bowel wall. Numerous parasites were felt in the bowel, they were there in hundreds.

The parasite is the *Ascaris megalocephala*, and though perforation of the intestine through its agency is by no means rare, still, because it is not common I thought the case worthy of record.

RABIES IN THE HORSE.

BY LIEUT. S. F. G. PALLIN, ARMY VETERINARY CORPS, MUTTRA, INDIA.

THE following are notes on a case of rabies, which occurred in a horse of the 15th Hussars, at Muttra, India.

The subject was a seven-year-old grey Arab gelding, admitted to hospital on the morning of October 10, with the history that he had been off his feed since mid-day on the 9th.

Symptoms.—The most noticeable symptoms were a dull and haggard appearance, with paralysis of both lips. The muzzle and ears were cold; there was a fœtid odour from the mouth, and ptyalism, apparently due to paralysis of the organs of deglutition. On movement, which was slow, signs of general paresis were marked; reflex was produced by pin pricks on the body and legs, but not on the muzzle. The membranes were slightly injected, pulse 55 and full, respirations normal, temperature 101° F.

The horse refused food, but tried to drink water, putting the whole muzzle into it, and making a sucking noise with the tongue, but swallowing none.

Treatment.—The horse was placed in a comfortable loose-box, his legs well rubbed, and warm bandages applied. An ice-bag was fixed on the head, and he was back-raked, but a warm enema could not be given owing to the horse suddenly showing signs of irritability and excitement, walking round the box and pawing with his fore feet. It was then that I suspected that I had a case of rabies to deal with, and the horse was treated as such.

On further examination a small, recently healed scar was found above the off hock, but this was said to have been caused by a kick.

At 6 p.m. the horse's condition was unchanged, his temperature 101°. He had remained quiet, except when disturbed; then he tried to climb the wall, biting at it and occasionally leaning against it as he walked round, appearing very weak. In spite of this he jumped out of his box, clearing a bar four feet high, but fell on landing, and was with difficulty got on to his legs again.

Next morning (11th) the symptoms of paralysis were more marked, with almost complete amaurosis. The horse pricked his ears at the slightest sound, and became very excited on interference, snapping at anything near him; movement brought on marked dyspnœa.

He had had motions during the night, which were scant but normal in appearance; pulse 72, growing weaker; temperature 100°; ptyalism more marked; he tried hard to drink water when offered to him. At one time he leaned his head over the bar until he fell down, nearly suffocated by the pressure of the bar on the trachea. The horse was then destroyed.

Post-mortem examination showed intense congestion of the brain and anterior part of the spinal cord, with numerous small hæmorrhages; the stomach was empty, and other organs were healthy. Part of the brain and spinal cord were forwarded to the Pasteur Institute of India, Kasauli, where a rabbit inoculated with the material died of rabies in a period of thirteen days.

A SALIVARY CALCULUS.

BY C. V. DALRYMPLE-HAY, M.R.C.V.S., VETERINARY HOSPITAL, TRICHINOPOLY, INDIA.

A CHESTNUT Waler gelding, aged 16, 14.3 high, the property of the Tanjore Palace Estate, was reported to be difficult to bit, and would not allow its mouth to be touched. On examination, a hard movable swelling 5 inches long in front of left cheek, and just above lower edge of top jaw, was noticed. The horse was thrown, and after applying cocaine, an incision was made at one extremity of swelling, and I readily extracted a stone 3½ inches long, with circumference measurement at largest part 3½ inches. The stone is bean-shaped, and weighs 3 ounces. I sutured the edges of the wound and dressed with boro-iodoform, and kept the horse on pillar-reins. The wound healed well.

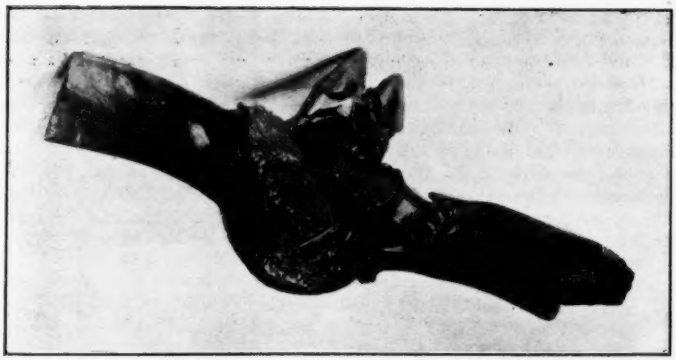
FRACTURE OF FOURTH LUMBAR VERTEBRA IN A RACEHORSE.

BY CAPT. H. A. SULLIVAN, A.V.C., PRINCIPAL OF THE VETERINARY SCHOOL, POONA, INDIA.

THE following case of fracture of the fourth lumbar vertebra in a racing mare named "Dorade" is, I think, of interest from the manner in which it came about.

The mare was being got ready for the Poona races in 1904, and was doing a three-quarter speed gallop on the tan course, which is on the outside of the grass course, and where all work is done until just before the races. The tan course at the time was rather dry, and in coming round the bend the top surface gave way and the mare's legs slipped out behind her. She recovered herself and finished the gallop, being at that time about the distance post: but when she pulled up was seen by her trainer to be going lame behind, and as soon as she had been

rubbed down she was sent to the School Hospital. She had gone only about 300 yards along the road, however, when she suddenly fell down and was unable to get up, The School ambulance was despatched to the scene, and brought her up in a recumbent position, whence she



Fracture of the Fourth Lumbar Vertebra.

was taken out (still in the recumbent position) and placed in a loose-box. On examination it was found that there was no sensation posterior to the loins, and in a couple of days, with the owner's consent, she was destroyed. The photograph shows the fracture right through the body of the vertebra, and involving one of the transverse processes.

A CASE OF FRACTURE OF THE OCCIPITAL BONE.

BY CHARLES TOWNSEND, M.R.C.V.S., LONG STANTON.

THE subject of this case was a chestnut hackney stallion who was found early one morning lying down in the middle of the loose-box unable to rise, and my immediate attendance was requested. Upon my arrival I found the animal lying on his side practically motionless, except that he would occasionally make a few faint struggles with his limbs, extremities cold, sweating, amaurosis, pulse very weak, in fact almost imperceptible, breathing stertorous. My attention was called to a small wound on the poll, large enough to admit of one finger, which no doubt accounted for the above symptoms. The question was immediately asked as to how this was caused, and, as the animal was in perfect health overnight, at first foul play was suspected; but an examination of the stable soon put this idea on one side, for at the height on the wall where the nine-inch brickwork terminates for the four and a half inch, we noticed a small quantity of matted blood and hair, and upon one or two of the bricks of the stable wall were a few drops of blood.

No treatment was adopted, this being deemed useless, death taking place soon after my departure. A careful *post-mortem* examination of internal organs revealed nothing abnormal, but upon removing the skin in the region of the poll, I found a quantity of extravasated blood: the muscles were also bruised and lacerated, and examination of the skull disclosed a fracture of the occipital bone which extended from the left condyle to the foramen lacerum basis cranii, with extravasation of blood into the cranial cavity.

Remarks. — Although cranial fractures are not by any means uncommonly met with, this variety is fortunately rare. One would think that a blow sufficiently violent to give rise to a fracture of this kind would cause almost instantaneous death. In all probability it was done early in the morning, the animal having reared, playfully, upon hearing the groom enter the stable and had fallen over backwards, striking the edge of the brickwork and thus causing the injury.

TUMEFACTION OF SPERMATIC CORD AS A SEQUEL TO OMENTAL HERNIA.

BY CHARLES TOWNSEND, M.R.C.V.S., LONG STANTON.

THE subject was a valuable three-year-old bay hunter gelding, which was castrated as a yearling, the operation being performed standing, with the caustic clams. Nothing abnormal was noticed at the time except that he was an unusually awkward colt for the standing position. On the fifth day after the operation I was again sent for, and found a considerable portion of omentum protruding from the left scrotal wound: this latter (as one always finds when the omentum has protruded for any length of time) was considerably thickened, and its meshwork infiltrated with blood; this I removed as high as I possibly could after exerting considerable traction. What little scrotal swelling was present soon disappeared, and healing of the wound soon took place. Nothing unusual was now noticed for nearly two years, when the owner again asked me to call and examine this colt when I was near, as he thought it was ruptured. Upon examining him I must confess that at first I was rather at a loss as to the nature of the swelling, which was now about the size of one's double fists. It was very soft and pliable and did not seem to be very firmly attached to the underlying skin, and upon manipulation could be pressed somewhat into the canal. Knowing what occurred when this animal was castrated, I thought it might possibly be some coils of omentum with possibly some portions of intestine; however, I determined with the owner's consent to operate, and after casting and chloroforming the animal (as if for the rig operation), I first examined the rectum and explored the internal abdominal ring, but this revealed no rupture, although the inguinal canal was evidently larger than the corresponding opposite one. I now incised the scrotum and soon found that I had a case of tumefied spermatic cord to deal with, and having inserted through the end of the cord a strong tape suture to enable me to exert more traction on the tumour, I commenced to dissect the cord from the adjacent structures; hæmorrhage was not great, although the veins which I ligatured were naturally abnormally dilated. This

I continued to do until I reached the external abdominal ring, and having pulled the growth from the ring as far as possible, I divided it with the clamp and iron. By removing it with the actual cautery I thought it would render the growth less liable to recurrence. I now plugged the wound with aseptic cotton-wool, and having sutured the skin wound, allowed the animal to rise. I removed the sutures and cotton-wool the following day. The wound gradually healed up, no scrotal swelling or thickening was left, and the animal made an uninterrupted recovery. The growth, which weighed nearly three pounds was composed of loose connective tissue, more or less gelatinous, together with the remains of the spermatic cord, and curiously, in the centre was a considerable piece of omentum which extended upwards for nearly its entire length, and save for being practically non-vascular (whitish), was normal in appearance and structure.

Remarks. — Although I find omental prolapse a fairly common complication and sequel to castration, yet it has not fallen to my lot to meet with a case of this description in my previous experiences, and as I usually castrate a large number of colts annually, I am inclined to think this is rather an uncommon occurrence, which is my reason for recording it. One cannot always tell before operating whether prolapse will occur, since a week or even ten days may elapse before the omentum protrudes from the scrotal wound, in which cases I have reason for thinking that rolling and straining, are possible factors in its causation.

SOME CASES OF FRACTURE.

BY LIEUT. DUNCAN MACDONALD, A.V.C., NEEMUCH, CENTRAL INDIA.

Fracture of the Symphysis Ischii.

Case I.—The subject of the accompanying photograph was a bay Australian gelding about ten years of age. He was lame on the near hind leg and had a slight drooping of the near quarter. The history of the case was vague, but it was said he "slipped up" in his standing. Injury to the pelvis was suspected, but no fracture could be detected. After four months' treatment the lameness wore off to some extent, but as the animal also suffered from a ringbone in front, he was destroyed. The *post-mortem* showed a fracture through the symphysis ischii as seen in the photograph. Slight union apparently took place above, as can be seen from the under surface.

The fracture seemed to me a curious one and the lameness most peculiar. There was no "straddling gait," simply slight lameness and drooping of the near quarter.

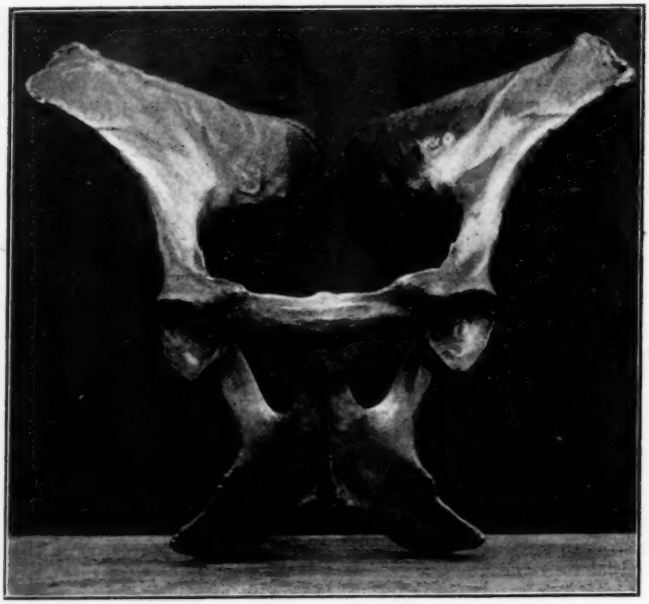
Fracture of the Metatarsal Bone.

Case II.—The subject, a Waler gelding, was shown to me one morning lame on the near hind. He stood with his toe only resting on the ground and could put no weight on the leg.

History.—He was found by the sentry in the early morning, standing with the leg—to which the heel rope was attached—in mid-air. He hopped across to the hospital on three legs and I saw him shortly after.

I found there was a simple fracture of the lower third of metatarsal bone extending from the inside about three inches above the lower end of the bones downwards and outwards. It seemed to extend into the joint. There was a good deal of swelling, but the fractured ends could be moved quite easily.

Treatment.—Fomented and hand-rubbed the part for about an hour and a half, put the animal into slings, and after padding the hollow of the heel well with cotton-wool, bandaged from the coronet



Fracture through the Symphysis Ischii.

to just below the hock with an ordinary calico bandage, then with rolls of thin muslin, and put on a thick plaster of Paris bandage from the coronet to half-way up the metatarsal bone. Left this on for five weeks, when I took the bandage off completely and let him out of slings. He limped a good deal but could put a fair amount of weight on the leg. There was a large exostosis, which I thought would certainly interfere with the action of the joint. I had him blistered three times within the next two months, and the enlargement gradually became reduced till there was scarcely any left. In four months from the date of the accident the animal was working sound in the battery to which he belongs.

The peculiarity of the case to my mind is that the exostosis, which was very extensive, did not permanently interfere with the action of the joint.

CLEFT SOFT PALATE IN A FILLY.

BY J. F. CRAIG, M.A., M.R.C.V.S., PROFESSOR IN THE ROYAL VETERINARY COLLEGE OF IRELAND, DUBLIN.

THE above case was examined in August, 1905. The animal was a fifteen-months old brown filly, which had been purchased by the present owner three weeks previously at a local Irish fair. Nothing abnormal was noticed in the filly at the time of purchase; there was no appearance of any discharge from the nostrils. Immediately the animal was given some water or food on arrival home, the first symptoms of the affection were shown. In drinking water or gruel a gulping sound was produced, and most of the fluid was returned by the nostrils; solid food taken in by the mouth was very slowly masticated, and repeated attempts made to swallow. Even then some portion of the food passed out from the nasal chamber. The more solid the food taken in, the smaller proportion of it returned. The repeated passages of food material through the nasal chamber set up a catarrh of the mucous membrane, and hence at the time of my examination a glairy mucous discharge was to be seen hanging to the wings of the nostrils. The history of the case which I have just described was given me by the owner when he brought the animal for my inspection. I offered the filly some water and afterwards some hay, and noticed the same effects as those above described.

Suspecting cleft palate, I made a manual examination of the buccal cavity, and found the soft palate split into two lateral halves from its free extremity to its attachment to the palatine bone. The hard palate was apparently quite normal. My belief was that the condition was congenital, but the owner had not taken the precaution to provide himself with the name and address of the dealer from whom he purchased the animal, and consequently no information with regard to this point was available. At the time of purchase the filly was in fair condition, and had not gone back in appearance under the charge of its new owner. As for treatment, I am of opinion that an operation was not practicable. The soft palate was placed too far back to scarify the borders of the cleft, and securely suture them together. The only advice which I gave was to feed the animal chiefly on hard dry food, such as hay and oats. By so doing very little food material would be returned by the nasal chambers, and the mucous membrane of the latter less subjected to irritation.

I know nothing of the after history of the case. I give the above account because of the apparent rarity of the condition in the horse, and also because occasionally such an affection might escape detection in examination of horses for soundness.

THREE CASES OF OVARIOTOMY IN THE MARE.

BY J. F. CRAIG, M.A., M.R.C.V.S., PROFESSOR IN THE ROYAL VETERINARY COLLEGE OF IRELAND, DUBLIN.

CASE 1.—Subject was an aged grey pony mare which had become almost unmanageable. When touched she would squeal and kick, sometimes strike with her fore feet and use her teeth. She was

prepared by withholding most of her food allowance for two days previous to the morning of operation.

Preparation of Instruments.—Instruments used were écraseur (Hobday's pattern), and guarded bistoury (bistouri caché). These were boiled for fifteen minutes, and then placed in a basin previously scalded and containing 2½ per cent. carbolic lotion. Three towels and some cotton-wool were also boiled for the same period. A second basin was used containing 2 per cent. creolin solution.

Operation.—On September 22, 1905, the mare was with considerable difficulty put down with hobbles and chloroformed. The fæces were removed from the rectum by an assistant. I then washed the hind quarters and the perineal region of the mare with soap and sterile water, and douched with creolin emulsion. I also washed my hands and rinsed them well with the same fluid. A rope was attached to the tail to drag it forward out of the way, and one of the boiled towels wound round the tail. Another of the towels was placed just behind the animal, and the third one over the quarters which were uppermost. The vagina and vulva were then washed out with 2½ per cent. carbolic lotion, the cotton-wool being used as a sponge. I inserted my hand with the guarded knife into the vagina, and made a puncture forwards in the wall of the passage above and in front of the os uteri. The puncture was effected with some difficulty; and after that, with my fingers I enlarged the opening until I could pass my hand into the abdomen. With only the carbolic lotion as a lubricant I found it very difficult to move my hand and arm about in the abdominal cavity. I passed my hand over the upper surface of the uterus to gain the anterior extremity, and thence followed the horn of the uterus forwards and found the ovary at its anterior extremity. For manipulation of the left ovary I used my right hand, and for the right ovary my left hand. I next carried the chain of the écraseur through the vagina and through the wound into the abdominal cavity. I found it rather tedious to manipulate the ovary only within the loop of the écraseur. Sometimes a piece of bowel would be included. In the empty condition of the animal there was no difficulty in identifying the ovary as it is firm and well defined, and of its position directly in front and connected with the horn of the uterus. As a matter of fact, it lies about three inches in front of and below the level of the external angle of the ilium. The small intestine or small colon (and these, when containing fæces, are the only parts mistaken for ovary) are empty, and in any case the ill-defined swelling produced by the fæces should not present any difficulty in identifying them. The loop of the écraseur I find is best held almost closed, the loop end being arranged around the tip of the middle finger. When so held, the loop does not admit of the uncontrolled entrance into it of bowel, and when the ovary is reached it is caught in the loop by manipulation with the fingers on either side of the chain. One of the chains, unfortunately, broke during the operation, but was soon replaced by another which I had with me, and which had been boiled in case of accident. When the second ovary was removed, the vagina was douched out with 2½ per cent. carbolic lotion, care being taken that no bowels protruded through the wound in the vagina, and the animal allowed up. It was then taken to a loose box previously prepared, and very little food given the same evening.

Only a little grass and hay were offered. Grass and hay were continued, the animal being kept slack for two or three days, and daily exercise given. No straining nor bad symptoms of any kind resulted. For about three weeks the animal did very well and its temper had apparently changed. It was kept at grass and could be easily handled. Later, on manipulation, it began to squeal and rear up. In putting the harness on, some difficulty was still experienced. The animal has since then been continually at work, and although the improvement as the result of the operation is very marked, the pony still continues to squeal occasionally and to rear, but it is manageable.

The ovaries were small, about one and a half ounces in weight, very firm, but no marked abnormality could be noted in connection with them, even on microscopic examination. One contained a very large corpus luteum, about the size of a hazel nut, with a red centre, and each had a cyst of Morgagni attached to the fimbriated extremity of the Fallopian tube.

Case 2.—This subject, an aged chestnut mare about 15 hands high, was in the habit of kicking in harness, and recently had become difficult to manage. Ovariotomy was performed on December 29, 1905. The treatment previous to operation was similar to that in the former case. The instruments, utensils, and other materials were boiled; 2 per cent. lysol solution was used instead of 2½ per cent. carbolic lotion. The rectum was not emptied of its contents, otherwise the operation was performed as in previous case. About eleven ounces of chloroform were used. The operation lasted one hour.

The ovaries were very large, about three ounces each. Two cysts of Morgagni were found attached to the left Fallopian tube, one to the right, and a very large Gräafian follicle about the size of a hazel nut was arranged near the hilum of the right ovary. The lysol solution was a very great improvement on the carbolic lotion, as it acted not only as an antiseptic, but as a lubricant, and hence allowed of the easy movement of the fingers and hand through the vagina and in the abdomen.

The after-treatment was as in the former case, and, as in that one, nothing was done to the genital passage. No bad symptom ever appeared. The animal did well, and after about a fortnight was put to light work. The tendency to kick has entirely left the animal. A curious fact about this case was that in the spring of this year this animal came into a state of "œstrum." This condition passed off in two or three days.

Case 3.—The subject was an eight-year-old black pony mare. This animal was very fractious, a great kicker; she would not allow the hind quarters to be touched, and could not be put in harness. During œstrum the mare was quiet.

Ovariotomy was performed on May 12, 1906, and the same method employed as for Case 2. Three ounces of chloroform were used, and the animal was down for about an hour.

The left ovary weighed about two and a quarter ounces, the right ovary about two ounces. Each contained a large Gräafian follicle, and at other points was very hard, almost cartilaginous in consistence. On section many smaller cysts (Gräafian follicles) appeared in the interior of each ovary. The after-treatment was carried out as in the previous cases, but grass was used as a diet. No straining nor any

bad symptom was shown. The animal was not disturbed by the operation. She was put to grass two or three days later, but occasionally handled. She remained quiet for three weeks, and then a little of her old temper returned. However, this gradually disappeared, and now the pony has been put in harness, and is quite quiet and tractable.

LACERATED WOUND OF THE FETLOCK, WITH COMPLETE DISLOCATION OF THE METACARPO-PHALANGEAL ARTICULATION.

BY CAPT. A. J. WILLIAMS, ARMY VETERINARY CORPS, NORWICH.

On September 8 I was called to see a five-year-old troop horse belonging to the 7th (Queen's Own) Hussars, reported to have broken its leg.

The horse was picketed out, the picketing gear consisting of a foot shackle and ground rope; the horse was shackled by the near fore.

During the night one of the picketing ropes smashed, the horses on the broken line were removed and tied on to a rope with other horses until the damaged rope could be repaired.

The horse picketed next to the injured one started kicking; the sentry heard them fighting, and went to stop them; on the way there he heard the sound of a kick, and saw the horse rear up, plunge forward and fall, then rise again immediately, with the off fore swinging.

I found the animal suffering from complete dislocation of the fetlock joint, and ordered immediate destruction.

Post-mortem appearances.—A lacerated wound across the fetlock joint, about three inches long, the direction being from the outside downwards and forwards. The end of the metacarpal bone protruding through the wound, about three inches of the bone in sight.

On removing the skin, I found a large bruised area over the front of the joint, the capsular ligament and lateral ligaments ruptured, the end of the outer small metacarpal smashed, and the large metacarpal damaged underneath it; the end of the inner small metacarpal was also broken off.

The extensor pedis tendon was intact, but stripped from the bone for about four inches, the suspensory ligament and flexor tendons intact, but there was considerable laceration of the tissues on the inner surface of the suspensory ligament at the point of bifurcation.

The extensor suffraginis was frayed and stripped from the bone for about six inches.

The capsular ligament was torn across the front of the joint, also at the point where it lies on the anterior surface of the suspensory ligament; the anterior metacarpo-phalangeal ligament was also ruptured.

Remarks.—Cases of luxation of the phalanges are very rare, and are generally produced by violent struggles to free the foot. In this unusual case I think the injury was probably caused in the following manner: The animal, to escape the kicking, reared up and tried to

break away from the shackle. When the legs were in the air the kick was received; this lacerated the tissues, and probably partially displaced the bones, when the foot came to the ground with the body weight thrown on it, there being no support to the outside of the

Severe Dislocation and Wound of the Fetlock.

joint owing to the laceration of the tissues. The metacarpus was displaced outwards, and the end of the bone forced through the lacerated tissues.

I am indebted to W. Paget-Tomlinson, Esq., 7th (Queen's Own) Hussars, for the sketch sent herewith.

CALF DIPHTHERIA—RECOVERY.

BY J. CROWLEY, M.R.C.V.S., LISTOWEL, CO. KERRY.

THE subject was a seven months old calf in good condition.

History.—The owner noticed the calf "falling off" in condition, and salivating.

Symptoms.—He would attempt to eat solid food, but could not swallow it: would take liquid food, such as milk, in the usual way, and had a slight cough and a dejected appearance.

I was called to see the calf two days after, the owner noticing him ill. I took calf's temperature, and found it 2·5° F. above normal. I then examined his mouth, and noticed on the tongue, about on a level with the fourth or fifth molar, at each side a yellowish necrotic patch, extending into the substance of the tongue on the right side for about half an inch at the middle point of the lesion, and extending for about a quarter of an inch on the left side. The necrotic patch on the right side, which was about the size of half an egg split longitudinally, was about twice the size of the patch on the left side.

Treatment.—I scraped away the necrosed tissue with a scalpel, and ordered the parts to be washed twice a day with a strong solution of pot. perm., and internally I prescribed pot. iodid. for seven or eight days. I also ordered liquid food only for a couple of weeks.

Result.—Calf quite recovered in about two weeks.

LUXATION OF PATELLA.

BY J. CROWLEY, M.R.C.V.S., LISTOWEL, CO. KERRY.

I WAS called a couple of days since to see a colt which met with an accident nine months ago and got luxation of the patella. The colt was not properly treated when the accident happened.

I examined the colt, and found that I could with perfect ease place the patella in its proper position on the trochlea, and as easily I could displace it again (of course outwards). If I placed it in the proper position and allowed the colt to walk very quietly, slowly, and straight, he would walk all right; but immediately he went fast (as trotting or galloping), or turned or twisted, out the patella would pop again.

(I should feel thankful if some one would let me know the best thing to do in this case.)

FRACTURE OF THE OLECRANON IN A COW, INVOLVING THE ELBOW-JOINT.

BY J. CROWLEY, M.R.C.V.S., LISTOWEL, CO. KERRY.

History.—The cow attempted to get over a ditch and she fell as the result of her leg getting caught in some wire which was running along the top of the ditch.

I was called to see her nine days after the accident, and found that a "quack" had put two large pitch plasters to her shoulder, thinking it was "shoulder slip."

Symptoms.—On examination I found a punctured wound about the lower end of the olecranon process of the ulna, and towards the outside, from which was exuding a yellowish-red material, which I took to be a mixture of blood and pus, or red marrow and pus. The symptoms of fractured olecranon were not characteristic. The elbow-joint, and all round that region, were very much swollen. On further examination I diagnosed fracture of olecranon and advised slaughter. The owner did not slaughter the cow, which was very thin, but sold her to a butcher who slaughtered and sold her for human use.

I had an opportunity after the cow was killed and skinned of examining the lesion and confirming my diagnosis. I did not at the time think of buying the leg, but I saw the jagged ends of the bone; the olecranon was fractured at about the upper end of the articulation with the humerus.

I am sorry we have not a meat inspector here.

AN OBSCURE CASE.

BY MAJOR CHARLES ROSE, ARMY VETERINARY CORPS, JUBBULPOOR, CENTRAL PROVINCES, INDIA.

Subject.—Grey mare, 14.3, seen on morning of September 20, 1906.

History.—Being trained for a steeplechase. On the evening of the 18th, while being schooled over fences, had taken off 15 feet before the jump, and had just cleared it—a wonderful jump. But the mare is an extraordinary performer. The following morning she was very stiff, and had been so till brought to the hospital for my opinion, but it was found that the stiffness wore off with exercise.

Symptoms.—On seeing the mare I at once thought it a case of very bad laminitis, the hind quarters being placed almost under the sternum, and she crouched when moved, but greatly improved after walking and trotting for a few minutes. On examination I found no heat in the feet, I could pick up either fore foot with impunity, and strike the foot and shoe with a hammer severely without the mare showing any sign of pain. The legs and pasterns were clean.

Diagnosis.—I came to the conclusion the mare had strained her back, and gave a liniment of opium and camphor to be rubbed over the loins.

The following day there was improvement, and the patient was convalescent in a few days. She has been exercised the last four days and to-day goes to regular work.

The question is, was my diagnosis correct, as I have never seen a similar case before?

A CASE OF TETANUS IN A DOG.

BY T. HUGHES, M.R.C.V.S., WOODSTOCK.

Subject.—A very well-bred retriever bitch, two years old, belonging to the Cornbury Park Estate, Chalbury.

History.—On September 19 and 20, the keeper noticed a wound on

the dog's foot, supposed to be a bite from a badger or some other animal in the forest. The foot was well washed with Condy's fluid, but in three days it became very painful and swollen, when it was well bathed with hot water and poulticed and dressed again with Condy's. It suppurated, discharged, and the wound appeared to heal.

On October 3 the animal was noticed to carry her head very straight, and the neck was very stiff. She could not swallow, and consequently was thought to have a sore throat, which the keeper treated by fomenting and well rubbing with grease, but she gradually got worse, and on Monday, October 8, I was asked to go and see her.

Symptoms.—There was general stiffness of the body, the head being carried quite straight, the neck seemed slightly swollen. The muscles of the body were hard, and she had a stilty gait, and when standing her legs were placed under her like props. The tail was carried in a perfectly straight line with the body. The jaws could only be opened after the application of a considerable amount of force; the eyes were staring, but with no appearance of the membrana. The most peculiar symptom was the pricking of the ears and wrinkling of the skin of the forehead and between the ears.

The temperature and respirations were practically normal. The bowels were constipated and the urinary secretion scanty and high coloured and of a peculiar odour. She had a craving for food but could not eat or drink.

Diagnosis.—Tetanus, due to the entrance of the tetanus bacilli through the wound in the foot.

Prognosis.—Unfavourable.

Treatment.—I prescribed absolute quietude, with only the head keeper to attend to her; the kennel (which was an exceptionally good one, a miniature lofty loose-box with yard) was darkened. I administered gr. vii. of chloral hydrate three times a day, and gave castor oil in mild doses once a day, with glycerine enemata. The food consisted of beef tea (Liebig's), milk and eggs, whisky, &c.

On October 9 the symptoms became aggravated.

On October 11 the symptoms were much worse, and the patient could not now move without help. When the kennel door was opened she was lying down and had a severe fit of spasmodic rigidity, the head, legs and tail stretched out, the latter quivering; the ears were more pricked and the forehead and skin between ears more wrinkled.

Photographs were taken this day, but we had great difficulty to get her to stand, as she fell headlong continually.

On October 12 and 13 she was much about the same and had very severe paroxysms, the ears, if anything, being more pricked. She was taking nourishment and medicine well. The jaws could be opened slightly, and she sucked a bowlful of milk.

On the 15th the keeper saw her at four o'clock in the morning and fed her and left her quite comfortable, but she was found dead two hours later.

Photographs were taken of the patient, both standing up and lying down, but unfortunately they are not sufficiently clear for reproduction.

The rarity of the occurrence of this disease in the canine species makes the case worth recording.

VERMINOUS ANEURISM IN A FIVE-MONTHS-OLD COLT.

BY A. E. PAYNE, M.R.C.V.S., WEYBRIDGE.

On October 24, about mid-day, I was hailed by a farmer as I was passing his house, to give my opinion as to the cause of death of a five-months-old colt.

The carcase had already been examined by the farmer's son, the viscera showing lively signs of having been mutilated to a degree during the process.

Upon disentangling the bowels I observed a bunch of enlarged mesenteric lymphatic glands, and in the immediate vicinity was a tumour-like mass, about the size of a big walnut, which I was unable to account for. An incision with the knife revealed an enormously dilated and greatly thickened blood-vessel, containing a variegated clot, holding in its meshes dozens of armed strongyles of both sexes.

The colt had shown no signs of illness or pain (so I was told) till the morning of the 23rd; he was then found exhibiting symptoms of great pain, which continued more or less till the poor brute was relieved by death at 6 a.m. on the 24th.

A CASE OF COMPLETE RADIAL PARALYSIS.

BY CAPT. A. J. WILLIAMS, ARMY VETERINARY CORPS, NORWICH.

On February 16, the patient, a six-year-old charger, was being jumped. On moving off after landing the animal went exceedingly lame, practically on three legs, carrying the off fore, and was brought to the stable in a float.

Symptoms.—The knee, fetlock and elbow were flexed, point of elbow depressed, knee carried in front of a vertical line dropped from the point of the shoulder, scapulo-humeral angle open, toe only resting on the ground, the whole limb carried forward as a piece, and the toe dragged along the ground; pressure over the serratus and intercostal muscles caused great pain and panting.

Fig. 193, on page 516, in "Regional Surgery," vol. iii., Moller and Dollar, shows the position exactly as it was in this case.

I made a careful examination, but failed to find any sign of fracture of the first rib; the extensor muscles were completely paralysed.

History and Treatment.—The animal was placed in slings and fomentations applied.

February 17. Condition about the same. On moving the leg forward and supporting the knee, a little weight could be placed on the limb, when the hand was removed from the knee the limb collapsed.

Fomentations continued and extensor muscles massaged with lin. belladonna c̄ ol. olivæ. Pot. iodidi ʒii., sodæ bicarb. ʒi., given twice daily.

February 18. Much improved; foot placed flat on the ground, and a little of the body weight could be supported; elbow, knee and fetlock in normal position. Medicinal treatment continued and massage for twenty minutes morning and evening.

February 19. Puts weight on the leg, triceps very much swollen, treatment continued.

February 21. Shows great improvement; removed from slings, walking fairly well, stride uncertain, unable to clear the ground with the toe—this is especially shown on uneven ground. Swelling over triceps less; still shows pain on pressure over the serratus muscles.

Fomentations discontinued; massage twice daily; placed in a loose-box bedded down with peat moss.

February 28. Has had walking exercise on level ground for ten minutes, twice daily since the 22nd. The triceps now show some atrophy; exercise increased to twenty minutes twice daily; massage. Pot. iodidi and pot. bicarb., internally.

March 13. Continues to improve, muscles regaining their normal condition, walking well, shows a little lameness at a trot; massage, exercise, and stimulating liniment to affected muscles.

April 6. Has been doing long trotting exercise since the 31st ult.; shows slight lameness occasionally; triceps muscles still atrophied.

April 30. Going sound, muscles practically normal.

The animal remained practically sound, but as there was slight lameness shown occasionally, and the triceps were still slightly atrophied, swimming exercise was given once daily for a month; towards the end of this exercise the period given was about half-an-hour daily. The muscles regained their normal state and the animal went sound; towards the end of long exercise there was an occasional stumble, which seemed due to sudden relaxation of the muscles.

In July the animal was sent for a run at grass, in order to complete the cure.

I have lately seen two cases showing symptoms of incomplete radial paralysis; one case I attributed to bruising of the triceps in pole draughts; the other to bruising caused by pressure in the ranks when the young horses were in training.

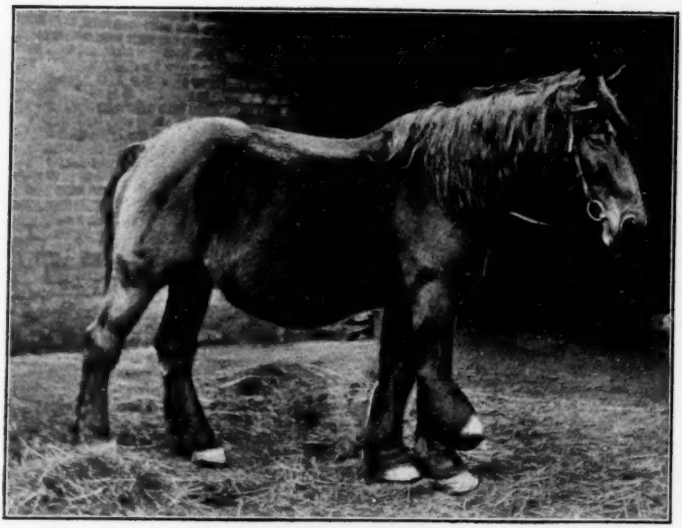
In these cases the weight of the body could be supported, but there was severe lameness, the toe was dragged along the ground, the triceps were swollen, hot and painful.

Pressure of the effusion, resulting from the bruising, seemed to be the chief factor in producing the symptoms, as the animals were practically sound as soon as the swelling and pain disappeared; there was a marked improvement in forty-eight hours, and recovery complete in from ten to fourteen days.

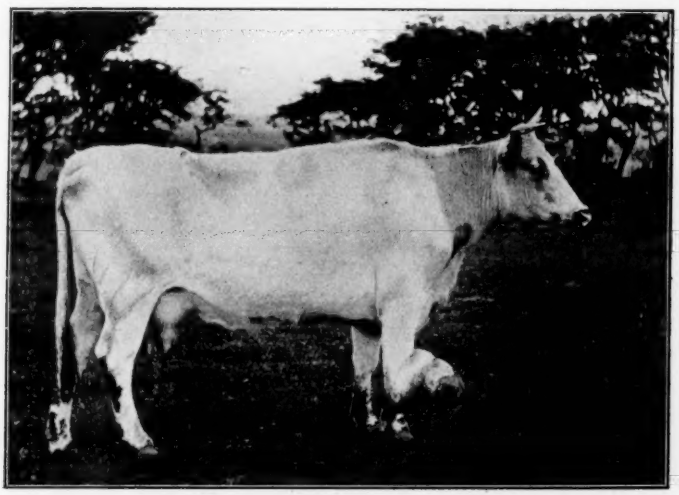
Treatment consisted of placing animal in slings, fomentations until the pain and swelling had gone, followed by cold irrigation and massage; removed from slings when the acute symptoms passed off; exercise started as soon as possible and gradually increased.

TWO INTERESTING CASES OF HYGROMA OF THE KNEE.

We have received two very interesting photographs of the above condition, each of which we have reproduced as illustrating the size to which these excrescences will attain without materially interfering with the general health or utility of the patient.



Hygroma of the Knee in a Mare.



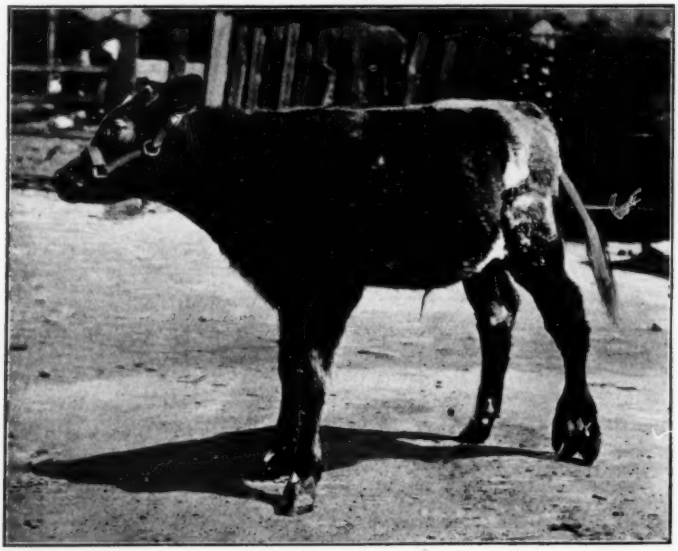
Hygroma of the Knee in a Cow.

The photograph of the cart mare was sent by Mr. W. Awde, F.R.C.V.S., of Stockton-on-Tees, the animal being about nine years of age and in regular work each day, and that of the cow being sent by Mr. Alfred Hodgkins, M.R.C.V.S., of Hanley, the animal being a Shorthorn in regular milk, 6 years old. The growth had taken about four years to attain its present size.

AN INTERESTING CASE OF DICHOTOMY IN A CALF.

BY P. SNAITH, M.R.C.V.S. BISHOP AUCKLAND.

THE photograph which is here depicted illustrates a somewhat interesting condition met with in a Shorthorn calf about 12 weeks old.



Case of Dichotomy in a Calf.

There was no history of abnormality in either the sire or dam. The left hind limb showed four distinct digits of equal size, and the calf was in every other respect of normal aspect and in excellent health.

A BAD CASE OF OPEN JOINT—RECOVERY.

BY CAPT. H. A. SULLIVAN, PRINCIPAL, A.V. SCHOOL, POONA, INDIA.

THE worst case of open knee-joint which I have ever seen or heard described, came under my notice recently in the Mounted Infantry in Poona, and I attribute the excellent recovery it made entirely to the use of a plastic felt splint which I placed behind the knee, and which

remained *in situ* for three weeks. The whole of the lower row of knee bones were entirely exposed to view, and a good part of the upper ones also, whilst a large number of fibres of the extensor metacarpi magnus tendon were torn away, synovia was escaping, and the knee was much enlarged and painful to the touch. In the first instance, after placing the pony in slings, I had the leg put in a leg bucket and well fomented, and after this placed a plastic felt splint about 12 in. by 4 in. behind the knee, securing it above and below with a bandage. The wound was left open except for a piece of gauze hung over the front. It was syringed out three times daily with a 2½ per cent. solution of carbolic acid, and then insufflated with equal parts of tannic acid and iodoform, and it never gave us a moment's anxiety. From the moment the splint was fixed and had set firm, the synovia ceased to escape, and the wound healed up famously, the excessive granulations being dealt with as necessity arose with a little caustic; the pony is now at duty again. The case in the first instance appeared to everyone, myself included, to be perfectly hopeless, and as I said before, I attribute its successful recovery to the use of the plastic felt splint.

DISEASE IN A HEIFER RESEMBLING ACTINOMYCOSIS.

BY J. F. CRAIG, M.A., M.R.C.V.S., PROFESSOR IN THE ROYAL VETERINARY COLLEGE, DUBLIN.

Subject.—Brown and white yearling heifer.

Symptoms.—The lower lip was very much thickened and somewhat dependent. On this account saliva could be noticed escaping and hanging in strings from the mouth. In several places both over the mucous and skin surfaces of the lower lip small openings were situated from which occasionally a small amount of yellow, thick, almost butter-like, non-granular pus exuded. These openings led into sinuses in the interior of the lip, some of which communicated with one another. Here and there on the skin surfaces of both lips were distributed small yellow points, each evidently involving a hair root. These, when they became too full, burst, and gave rise to the sinuses already mentioned. Stretching from the lower lip to the angle of the lower jaw in the intermaxillary space a large lumpy hard swelling was situated. About the centre of the swelling was the opening of a large sinus placed in the interior. Into this opening a finger could be inserted. From this sinus there was discharged a pus very similar in appearance to that escaping from the sinuses in the lips. A cord-like, hard swelling, the thickness of the finger, extended from the angle of the mouth to the base of the left ear. The parotid gland was also enlarged on the same side. The tongue and jaw were unaffected. The heifer fed well and ruminated. It was, however, hide-bound and in poor condition.

Previously, the case was treated as actinomycosis for three weeks, on the description of the owner, and potassium iodide administered. No improvement occurred. On this occasion small pieces of the tissue from the upper lip containing the pustules and from the cord-

like lump on the left side of face were removed and submitted to microscopic examination. Films of the pus were taken and stained with Gram and Ziehl-Neelsen methods. No tubercle bacilli nor actinomyces were found after a very careful search. Small micrococci arranged as staphylococci staining deeply with Gram appeared in the films in almost pure culture.

Small pieces of the tissues taken were fixed in formalin, dehydrated in alcohol, embedded in paraffin, and sections made from them. These sections were treated with the Gram and Cladius methods. The groundwork of the sections consisted of dense connective tissue. Here and there through the groundwork were scattered masses of small micrococci similar to and probably identical with those already noticed in the films, and immediately around them more or less densely packed masses of leucocytes. Little hope was given to the owner of a recovery. The only treatment recommended was a surgical one, but on account of the extent of the disease its eradication by this means was hardly to be expected. A week later the animal was operated on. The heifer was put down with hobbles and chloroformed, Cox's muzzle being used. The face was first washed with soap and Jeyes' fluid solution. Then a large antero-posterior incision was made along the middle of the lower lip. A large amount of the new connective tissue in the lower lip was dissected away. Some of the diseased skin was also removed, but care was taken to save as much normal skin as possible. The diseased portions were next cut away from the upper lip. Afterwards the swelling in the intermaxillary space was incised, and the tissue forming it in greater proportion removed. This opening was made to communicate with the incision in the lower lip. The cord-like swelling on left side of face was also treated in a similar manner, by excision. These wounds were next injected with iodine lotion (tr. iodi. 1, aquæ 10), and the animal allowed to rise. For the next few days a slight improvement seemed to result. The swelling became smaller, but still the wound freely discharged the thick yellow pus. During that time, the wounds were injected out daily with the iodine lotion. Later, the swellings increased in size, and again it was decided to operate. The animal was put down and more of the tissue of the swelling and affected skin of the face were removed. The swelling in the region of the parotid gland was also incised and an abscess opened containing about two ounces of the thick yellow butter-like pus which seems to characterise this affection. The wounds were then washed out with iodine lotion, and later the animal was allowed to rise. The iodine injections were continued daily for some time, but no improvement in the disease appeared to result. At the same time the animal received a much more liberal diet than usual. Mashes and small quantities of cake were given and the animal improved in condition. Some days later the heifer was sent home and treated there. The disease, however, did not disappear. On the contrary, it was observed to extend to the limbs of the animal, and after some weeks the diseased portions on the head and face increased in size and extent. Later the animal died as the result of extension of the disease over the surface of the body.

AN INTERESTING CASE OF FOREIGN BODY IN A PAROTID ABSCESS.

BY FREDERICK HOBDAY, F.R.C.V.S., KENSINGTON, W.

My attention was drawn in the early part of January to an outbreak of strangles in a stud of some thirty horses, and three of the animals were treated. A fourth, which was also infected, was treated by the horsekeeper himself, and the patient was not allowed to receive my medicine. In this animal a typical strangles abscess formed in the parotid region, and burst on the left side of the neck. I did not think any further of it until about five months later, when I noticed the animal still in the stable. As the horsekeeper, who had complete control of the management of the stud, still persisted in treating it himself, I did not prescribe; but two months after this, at his especial request, acknowledging that the case had beaten him, he turned it over to my care. Exploration with a probe revealed a foreign body to be present, and a pair of forceps speedily extracted half an ordinary hairpin. The horsekeeper asserted positively that he had never used such a thing near the wound, but I had grave reasons to suspect that he either did not speak the truth, or else really was in such a fuddled state when he did use it that he could recollect nothing about it. The owners thus, through putting implicit trust in this ignorant and self-conceited fellow, lost the use of a valuable horse for seven months. After the extraction of the half hairpin the wound healed up rapidly, and the horse went to work within a fortnight.

Reviews.

TUBERCULOSIS: ITS ORIGIN AND EXTINCTION. By W. Pickett Turner, M.D. 96 pages, 25 illustrations. Published by Messrs. A. and C. Black, London. 2s. 6d.

This little book, written as it is by a Doctor of Medicine, is one of the most extraordinary that has yet been brought to our notice. The author is so well aware of the weakness of his arguments and the audacity of his statements, that he attempts, as it were, to disarm criticism in the leading sentence of his preface, where he says: "The views herein expressed are so completely novel, so purely original, and so utterly unorthodox, that they cannot fail to provoke hostile criticism." Nearly half the book is devoted to matter quite irrelevant to "tuberculosis," and the same applies to more than twenty of the twenty-five illustrations.

When we come to the part directly devoted to tuberculosis, we find an amazing series of statements, without one particle of proof being adduced to support them. The author says that the "Timothy bacillus" is the potent factor in producing tuberculosis of cattle, by what he explains to be some sort of "natural affinity." Yet he says, "It is not solely due to Timothy grass, as this was only imported into this country in 1780 . . . and tuberculosis was with us long before that date."

But we would ask why sheep are not commonly affected if the Timothy bacillus is responsible for the disease. We know that it is not due to any special immunity in sheep, as they are easily affected experimentally. Again, one is almost staggered by the cool effrontery with which the author repudiates the correctness of the diagnosis of tuberculosis in sheep and horses, recorded in statistics published in Leipzig, and quoted by the 1898 Royal Commission, who thereby accept them. Because those statistics do not coincide with his theory, the author calmly brushes them aside and says, "the diseases in these animals was produced by a different species—was, in fact, pseudo-tuberculosis." Later, he forgets all about his "Timothy bacillus," and says, "it may be produced at will by placing cattle in ill-ventilated and ill-lighted buildings," evidently spontaneously generated.

The manner in which the author disposes of Avian Tuberculosis shall speak for itself. It is quite characteristic of his logic, and of the proof he brings forward to support his statements. "As the tubercle bacillus only grows between the temperatures of 30° and 41° C., and the normal temperature of the fowl is 42° C., it cannot be true tuberculosis. In the few cases in fowls I have seen, the liver was the principal organ affected. I have had no opportunity of examining it microscopically, but should expect to find it was not tuberculosis at all. Venturing upon a sporting guess, I should say it was actinomycosis, as . . . barley is the staple diet of fowls." This scientist (*sic*) admits his inclination to sporting guesses, and we venture to assert that his theories of tuberculosis belong to the same category.

But we are forgetting a part of our story (it is difficult for us to remember that we are not reading some amusing children's fable). The author tells us in all seriousness to put our cattle in glass houses, or in houses with roofs of violet tinted glass and tuberculosis will become extinct. He says, "Having placed our cattle under glass and restored their lost actinism, can we be sure of the result? I think we can. I will venture to predict that with the same unerring certainty that night follows day, these animals cannot by any possibility, other than accident, become tuberculous."

The only redeeming feature of the book is, that the author deplores the inadequacy of the present system or lack of system of meat inspection.

We can well imagine that the medical profession would have been highly amused if this production had been penned by a veterinary surgeon, but what must be their attitude when they realise that it has emanated from a member of their own flock? We fancy the author has anticipated us again when he says, "The practical outcome has been to place me upon a platform apart, not only from the members of my own profession, but also from the world at large—certainly not an enviable position." We are here disposed to agree cordially with him.

It seems ironically appropriate that the book should be dedicated to "The Mothers of England," since it is probable that the proverbial "old-ladies" are alone likely to be convinced by the author's mistaken endeavour.

The publishers' part of the work is really excellent and worthy of a better cause.

THE BREEDING INDUSTRY: ITS VALUE TO THE COUNTRY AND ITS NEEDS. By Walter Heape, M.A., Trin. Coll., Camb. Published by the Cambridge University Press. 154 pages. Price 2s. 6d. net.

This little book contains a well sustained argument in favour of central control of the important national industry of breeding. The author fills the first half with arguments and figures, to prove the importance of the industry to this country, and although we do not by any means agree with all his figures, such as the average value of cows in milk or in-calf at £20, or of calves at birth at £2 10s., &c., still we must agree with his main conclusions that the value of our live stock is so great as to be considered more of a national concern than is the case at present.

The author suggests the institution of a Department of Animal Industry along with the Board of Agriculture, the work of the department to consist of three main branches, viz.:—Records, Research and Administration. The Records' branch would mainly concern itself with statistics, while the Research branch would embrace questions of diseases and also of heredity and variation, the latter conducted by specialist physiologists. The author appears to be mainly a statistician, and as a result the book is full of interesting figures. He puts down the loss from sterility and abortion *of mares* and mortality of young at £2,500,000 per annum, *of cattle* £4,200,000 and of sheep £2,500,000, a grand total, approaching £10,000,000 dead loss per annum to the country. He continues, "Impossible as it is to arrive at a true conception, these figures will serve to give a broad idea of the losses breeders experience from these causes alone each year."

Up to this point we have mainly agreed with Mr. Heape, but we most emphatically disapprove of his treatment of the leaflet (No. 108, 1904) of the Board of Agriculture, on abortion embodying the results of Professor Cave's experiments. We admit Mr. Heape's right to criticise it if he wishes, and if he is possessed of sufficient technical knowledge of the subject to warrant it; but we strongly object to his innuendos, not outspoken statements, that the animals which Professor Cave diagnosed as being affected with contagious abortion and which he accordingly treated, were not so affected. In several places he says, "If the animals *were* suffering from contagious abortion" (the italics are Mr. Heape's). But as we have said before, the author appears to be mainly a statistician, and it is a pity he should divert to meddle with a technical point of which he obviously knows so little. We would suggest his reading Professor Bang's article on Contagious Abortion, appearing in the September number of this Journal, and then perhaps he will be able to follow Professor Cave's argument, and admit that although there may be yet much to learn on the subject, yet the "origin and progress" of the disease are more understood than he is aware of.

Taken throughout, however, the author has made out a strong case, and if his suggestions were made the basis for active movement by the authorities, it is certain that a huge amount of money would be saved annually to the country and at a comparatively small cost.

The printing and binding of the booklet are of the usual first-class style of the Cambridge University Press.

Personal.

We regret to hear that Professor Sir John McFadyean has had the misfortune to fracture his right shoulder, the head of the humerus being displaced. His horse shied at a boy who was flinging his cloak about, fell on the slippery wood pavement and threw Sir John heavily on to the point of his shoulder. The fracture was one which caused a good deal of pain, and necessitated the use of chloroform to set the bones in position, but the patient is now attending to his numerous duties, although, of course, somewhat under difficulties.

By the death of Mr. Thomas Simcocks, F.R.C.V.S., of Drogheda, in his eighty-sixth year, Ireland loses its oldest veterinary surgeon. Mr. Simcocks was a very prominent public official in his native town, being for many years a member of the Corporation, and on one occasion being elected as Mayor, an office which he filled with every distinction. He took an active part in professional matters, and was several times selected to fulfil the duties of Examiner to the Royal College of Veterinary Surgeons.

The profession will see with pleasure the name of Professor Boyce among the new knights. It is probable that no one exerted more influence in the establishment of the veterinary school in connection with the Liverpool University than did Professor, now Sir Rubert, Boyce, and his interest in its progress since has been untiring. It is gratifying to be able to record that he is recovering, although of necessity slowly, from his sudden and serious illness.

The Walley Prize, which is competed for by students of each of the respective colleges, has been gained by Mr. S. J. Motton, a student of the Royal Veterinary College, London.

The Government of New Zealand have recently formed a Volunteer Veterinary Corps, under Government control, of which the officers will all be duly qualified members of the Royal College of Veterinary Surgeons. The corps will be under the command of Mr. J. A. Gilruth, M.R.C.V.S., the head of the Veterinary Department, who will rank as a Lieutenant-Colonel.

Correspondence.

HORSES IN TIME OF WAR.

To the Editors of The Veterinary Journal.

Sirs,—Is it not desirable that the veterinary profession should approach the representatives of the Great Powers with a view to securing from them greater precautions, in all future wars, in the interest of the animals engaged therein? That no self-respecting nation can go on leaving itself unprepared for war, is obvious; but is it not also obvious that every self-respecting nation ought, in time of peace, to make such preparations and such arrangements as shall, in time of war, secure for animals due protection. Might I suggest that veterinary associations should bring this matter to public notice?

Your obedient servant,

Layman.

DAIRY INSPECTION IN IRELAND.*

BY P. J. HOWARD, M.R.C.V.S., ENNIS.

JUST recently the public mind has been shocked by the revelations of the "tinned meat scandals" from Chicago, and not very long ago the daily press had worked itself almost to a state of fever owing to the discovery that some brewers were adding a little arsenic to that popular beverage called beer. And have not we had almost a Commission to enquire into the purity of our whisky supply? And does not every rural council in the country try to excel in the purity of the water supply?

But what is the importance of any of those when compared with the importance of our milk supply, which, up to the present, has received but scant attention?

When we consider that milk is largely consumed by human beings, and that it forms the staple diet of the most important portion of our population, and at the most critical period of its life, we will readily agree that there should be some supervision over the sources from which it is supplied, so as to prevent, as far as possible, contamination by disease or otherwise, and thus secure the highest possible standard of quality for human use.

It is not my province to discuss the question of milk itself; our discourse shall be confined to the inspection, or rather the want of inspection, of dairies in Ireland.

The term "dairy" will embrace the cowshed in which cows are kept, and all other sheds, stores, or shops in which milk may have to remain for a time before being supplied to the consumer.

The object of inspection is the preservation of public health by ensuring that the milk supply is obtained under conditions that are absolutely essential to its purity.

The conditions essential to the purity of milk are: that the cows are healthy, that they have good food and water, that they are housed in sanitary surroundings, and that the attendants are clean and healthy, also that the milk vessels and stores are clean, and that all persons handling the milk are clean and healthy.

Now as dairy inspection in Ireland is conspicuous by its almost entire absence, we will direct our attention to the consideration of the reasons why inspection is absolutely necessary, and try to show that it is high time an attempt was made to adopt the necessary measures of control over the general management of our dairies.

We will glance briefly at the conditions under which our present milk supply is obtained. I believe the City of Dublin makes an effort to obtain milk under favourable conditions, but as for the rest of Ireland the conditions generally surrounding the cows, cowsheds, and attendants, are, in the majority of cases, unsatisfactory, and in many cases revolting. The cows are filthy and often openly affected with disease. They are housed in the most filthy holes, often sharing the house with pigs, with neither light nor air; and one generally finds three where there is scarcely room for two. The floors are covered with filth and the manure heap and cess-pool are just outside the door.

These are the conditions that obtain in nearly all the town and

* Read before the Congress of the Royal Institute of Public Health, Cork.

country dairies in Ireland, with very few exceptions. Then the attendants are by no means very particular, generally untidy, and often filthy in their habits. I have often seen a man spit on his hand and start to milk, and one commonly sees the attendant with dirty hands, dip a hand into the milk to moisten the cow's teats. The milk shops are mostly general stores, where groceries, meat, soap, and even paraffin oil, may appear on the one shelf with the milk.

It is scarcely to be expected that we get a pure milk supply under such conditions, and unfortunately statistics prove that allowing such conditions to prevail has played sad havoc with the public health, and has helped materially to impoverish our population. The necessity for altering such conditions, by enforcing proper regulations and providing proper inspection of dairies, can best be seen by just glancing at the many diseases that may be spread by the medium of milk.

Tuberculosis, typhoid, scarlatina, diphtheria, epidemic sore throat, may all be conveyed by milk, and there are authentic records of outbreaks of those affections which owed their origin to the milk supply.

Most of these diseases come in the milk by its getting contaminated with them, after being drawn from the cow, and such contamination might be prevented by the adoption of proper methods of precaution, and by having the attendants regularly inspected by the medical officer of health, whose duty it should be to see that no person about a dairy is suffering from any affection likely to contaminate the milk.

The most important disease that comes with the milk, directly from the cow, is tuberculosis, or what is commonly called consumption.

Now, in England and Scotland, for some years there has been a steady decrease in the number of deaths from tubercle, but in this unfortunate country statistics prove that consumption has sadly increased to such an alarming extent, that if stringent measures are not enforced to check its spread our population will soon be extinct.

When we consider the large percentage of juvenile deaths due to tubercle, and couple with it the alarming fact that about 30 per cent. of our dairy cows are affected with tubercle, we will see that it is about time we did something to stay the ravages of that terrible scourge, and thus help to save and regenerate our people.

Our present Chief Secretary, in a recent speech, mentioned, as one of the four urgent needs of Ireland, "the attention to the health of the people."

It will at once suggest itself as a remedy for the conditions I have pointed out, that the first thing necessary is the thorough inspection of all dairies used for public milk supply.

Now that worthy institution, the British Government, in its wisdom has framed the "Dairies, Cowsheds and Milk Shops Order," but with the usual policy adopted towards this country of killing with kindness, it has not made even an effort to have the conditions of the said Order enforced, and indeed, as is usual, it has muddled the Order in such a fashion that without emendation it is almost useless, for while it regulates for the conditions of the cowshed, it almost forgets about the cow.

The Order sets forth that Rural Councils are empowered to make regulations:—

(*a*) For the inspection of cattle in dairies.

(*b*) For prescribing and regulating the lighting, ventilation,

cleansing, drainage and water supply of dairies and cowsheds in the occupation of persons following the trade of cowkeepers or dairymen.

(*c*) For securing the cleanliness of milk stores, milk shops, and vessels used for containing milk for sale by such persons.

(*d*) For prescribing precautions to be taken by purveyors of milk and persons selling milk by retail against infection or contamination.

Then a further Order suggests some model regulations drawn up in the usual official phraseology and bound with a fair supply of the material known as red tape.

Now the model regulations suggested for the inspection of dairy cows goes on to state that they may be inspected by the sanitary officer or medical officer of health. Such a regulation is on the face of it absurd, as neither one nor the other is competent to inspect cows.

We all know who the sanitary officer is and his notions of inspection. Perhaps he may be the relieving officer as well, and, may go direct from a house in which he has been seeing about typhoid or scarlatina, to make his inspection of the cows.

The medical officer of health will find enough to do to inspect the dairy people. His competency to inspect cows is very doubtful, as the knowledge generally displayed by medical officers of health regarding animal diseases is, to say the least, at times very amusing. The proper inspection of cows can only be made by a qualified veterinary surgeon, and to show that such is the case I will quote what one of the best possible authorities on this particular matter has stated.

Dr. Sims Woodhead states: "After a careful study of the question of milk control in France, Germany, Denmark and Sweden, I am convinced that until the medical officer of health, the veterinary surgeon and the local authorities can act together and in full accord we shall not attain an ideal control of our milk supply. In the course of my work I have had to deal with a very large number of diseased animals of various kinds, and although I may claim that I have picked up a very fair knowledge of the pathology of the diseases of animals, and an amateur knowledge of the symptoms beyond that gained by most medical men who have not gone through a special course of veterinary training, I have not the slightest hesitation in saying that whenever I want a reliable opinion on any animal, or whenever I desire to learn anything about the natural history of a disease in an animal, I at once appeal to a veterinary surgeon, and in most cases I am thoroughly satisfied with the opinion that I get. I do not say that I would take the opinion of every surgeon, even against my own, but I am satisfied—and my experience of this matter is a very extensive one—that a good veterinary surgeon, especially one who has been well trained in comparative pathology, as the younger generations of veterinary surgeons undoubtedly are, will give a more reliable opinion than a medical man of the same standing."

Thus we see that to have a thorough inspection there must be a veterinary as well as a medical officer of health, acting in conjunction. The duties of the one to supervise all matters in connection with the cows, and the duties of the other to control matters pertaining to the attendants.

France, Germany, Austria, Italy, and other nations have the inspection of their dairies almost entirely under veterinary control,

and spend large sums in providing and maintaining their veterinary staffs.

We will briefly further note the other model regulations for dairies.

The model regulation for lighting states that sheds must be lighted by "windows." In Ireland it is hardly likely they will be lighted by electricity.

The model ventilation provides for openings into the external air. The model cleansing provides for limewashing twice a year, and that the floors be swept clean. It does not say how to sweep our cobble stone floors clean.

Then there is a model drainage, and a model water supply. These regulations apply to sheds from which the cows are turned out every day or grazed out portion of the year.

There is a special set of regulations for sheds from which the cows are never turned out. They provide 800 cubic feet air space for each cow, good light and ventilation. They also provide that the floors be washed once a day. The milk stores and shops are to be specially clean, and the milk vessels are to be cleaned with steam or boiling water.

There are also suggestions for precautions to prevent contamination. The milk must not be exposed to smells nor kept in sleeping rooms nor kitchens. The cows' udders are to be kept clean and the milkers' hands are to be free from contamination.

There is not a single word as to who are the proper persons to superintend such regulations, nor a single line as to the health of the cows nor that of the attendants.

We know that the cows may be largely affected with tubercle, without showing any marked symptom observable by the ordinary man, and we know that the tuberculin test reveals even the slightest cases. Some of our neighbouring Continental powers spend fortunes in carrying out such regulations for securing the health and well-being of their people.

But the British Government, that Jingo constituted pioneer of civilisation, while it squanders millions in its pretended anxiety for the welfare of savages, will not spend a few pounds in protecting the health of a nation which has largely contributed to make the British Empire, and which gets in return ready-made laws and Boards and Councils which are so firmly bound with red tape that they are incapable of being loosened or made workable.

To establish a successful system of dairy inspection in Ireland, we must instruct our people and impress on our public bodies the necessity for such. Indeed, the existing medical officers of health, the medical officers of our public institutions, and the medical authorities generally, have, I fear, through carelessness or ignorance, or perhaps both combined, not made use of the many excellent opportunities afforded them of educating the public mind by directing attention to such important matters.

The following regulations in regard to dairies will, I think, recommend themselves, and could be adopted generally without considerable expense. The resulting benefits would repay a thousand times over the expense of working:—

(1) All dairies should be licensed.

(2) The cowsheds should be properly constructed, lighted, and

ventilated, the floors of concrete or tiled, and the walls cemented, so that all may be washed and cleaned regularly. In towns where people can afford it the Local Government Board model regulations as to air space might be applied, but in poor places, and where the cows are out every day, those regulations are impossible.

(3) The water and food supply should be good and pure.

(4) The cows should be kept clean and regularly examined for tuberculosis by the veterinary officer.

(5) The attendants should be regularly inspected by the medical officer, and made to adopt clean and tidy methods.

(6) The milk vessels and stores should be clean, and, if possible, the milk kept in a separate place.

(7) The owner to at once report anything wrong with cows or attendants, and be subject to a heavy fine for infringement of any of the rules.

In the present impoverished state of this country we cannot well aim at any more polished or expensive regulations, but I sincerely hope there will be no longer delay in putting some such simple measures in force. In time, when our people have been rescued from the semi-slavery and oppression under which they have lived so long, and when education will have opened their minds, we may hope to see model regulations of our own in force.

I have tried to touch briefly on the main points of this important subject; my aim has been to show the want of dairy inspection in Ireland, and I trust I have succeeded. I hope our efforts now will not be confined to a mere academical discussion, and that we may look forward to some tangible results by directing public attention to matters so gravely affecting the public health. It is said that charity begins at home, and I do hope that our Government, instead of sending missions to Thibet, will devote the funds to establishing and maintaining, in conjunction with our local authorities, an efficient and workable scheme for the proper inspection of dairies in Ireland.

Translations and Extracts.

RINGWORM IN THE DOMESTIC ANIMALS.

BY PROFESSOR L. G. NEUMANN.

THE disease of the skin commonly called "ringworm" is due to the dermatophytes or dermatomycoses, lowly organised parasites belonging to the vegetable world.

After discovering the place occupied by the dermatophytes among the fungi, the author summarises the studies that have been made as to their nature.

In the domestic animals there are six different kinds of dermatophytes, viz., Trichophyton, Eidamella, Microsporum, Achorion, Lophophyton, and Oospora. They vary in their way of growth in cultures, and microscopic examination shows variations.

(1) *Trichophyton.*—The mycelia are either simple filaments or ramified. They are minutely divided up and produce mycelial spores 4 to 9 microns in diameter. Sabourand's division into ectothrix, endo-

thrix, and endo-ectothrix, according as to whether the parasite grew inside, outside, or both, is of no practical value, as it may grow in any of these situations.

(2) *Eidamella.*—The mycelium is very ramified, the branches being 1 to 5 microns in diameter. They are divided into very small segments, which break off into square or oval segments.

(3) *Microsporum.*—The mycelium throws off lateral ramifications, carrying of conidia from 2 to 3 microns in diameter.

(4) *Lophophyton.*—The mycelia are in filaments, some very twisted, with a very fine thin wall containing no protoplasma ; others are short, with a thick wall, and contain granular protoplasma but no spores.

(5) *Achorion.*—The filaments of the mycelium are both straight and curved, 2 to 3 microns in diameter ; in segments 12 to 15 microns long. They are divided into two, three, and four branches, with a thick wall.

(6) *Oospora.*—Mycelium is composed of filaments 2 to 3 microns in diameter, mixed up with round or oval cells 5 to 6 microns in diameter, in long irregular chains.

The tendency of ringworm is to become chronic, it is transmitted from one animal to another by direct contact, or indirectly by means of grooming utensils, bedding, &c., or by spores carried by the air. The spores are lodged in the epidermis, penetrate into the hair, decomposing the cells; this gives rise to loss of hair, itching, redness of the skin, and exudation.

Numerous experiments have been made as to how long the spores retain their vitality. According to Gerlach, six months; Seidamgrotzky and Mégnin, eighteen months; and Thin, eleven months. Water, olive oil, lard, vaseline, carbonate of soda, sulphur and croton oil have a very slight action. Black soap, acetic acid, 1 to 100, and yellow ointment, kill the parasite in an hour.

The clinical symptoms are sometimes obscure, and it is always advisable to have recourse to a microscopical examination. The parasites are always most abundant in the deeper parts of the scales and the hairs at the edges of the circle. The fragments are treated with absolute alcohol or ether to remove the fat ; removed on a slab, and two or three drops of a 30 per cent. solution of potash added, which is heated ; gentle pressure with the cover glass will break up the cells, which are mounted in carbolic solution. Fluid culture media are not favourable for their growth ; they do best on neutral or slightly alkaline glucose.

(1) *Ringworm of Horses and Donkeys.*—This can be divided into two classes: the microsporosis caused by the *Microsporum Audouini*, and the trichophytes, of which there are five varieties.

Microsporosis.—The contagious herpes of foals; round patches on the shoulders, neck, ribs, and head, uncommon under the belly and on the limbs, and absent on the forehead, mane, and tail. The hair stands up on end, is brittle, and falls off at the edges of the patch, which turns a blackish-grey colour, moist, thin, dry, covered with scales of a grey or yellow colour that sometimes are of a brilliant aspect. In the latter stages the hair turns dark, but there is seldom any itching.

Calvé and Malherbe have described another variety of microsporosis in which the patches are smooth, and covered with glistening scales, and are situated chiefly on the limbs. This form is generally seen in the spring, and recurs annually.

Trichophytes (*a*)—*Trichophyton flavum.*—The patches are large, grey-coloured and smooth, but with no trace of suppurating folliculitis. The hairs get matted together into a greyish-yellow crust and fall off with it.

(*b*) *Trichophyton equinum.*—The patches are about 3 centimetres in diameter, and are generally found on the quarter and shoulders; on the back they are confluent. When rubbed a thin crust will fall off and with it the hairs. At first the patch is wet, but it soon drys up, and is covered with greyish, bran-like scurf.

(*c*) *Trichophyton verrucosum var. equi.*—Patches 5 to 6 centimetres in diameter, on parts where the harness rubs. The hairs fall off with a soft crust, leaving a grey patch, that does not suppurate, covered with bran-like scales.

(*d*) *Trichophyton verrucosum var. asini.*—The lesions are the same as in (*c*). In the donkey they are located on the neck, head and ears.

(*e*) *Trichophyton mentagrophytes.*—Situated on the head and nose. The hairs get matted together into a yellow crust, which leaves a red patch covered with cracks.

Ringworm in the horse will die spontaneously in from forty to fifty days, but if neglected it will spread, and the spores getting on to other parts of the body will start fresh centres. It is very amenable to treatment, and does not affect the general health; it is, however, very contagious, and generally spreads through a stable. Clinical examination is not sufficient to distinguish the different species. Young, dark-coloured horses appear to be most susceptible.

The different species of ringworm are transmitted from horse to horse, from horse to ox, and *vice-versâ* (Reynal, Gerlach, Mégnin), and from the horse to the dog, sheep and pig (Siedamgrotzky).

Cases of infection in man have often been reported, but equine ringworm produces different lesions.

Treatment is simple. Ointment and oil are preferable to tinctures or solutions. Green soap, corrosive sublimate, 1 to 300, carbolic oil, oil of cade, tincture of iodine, and red mercury ointment, 1 to 3*, are recommended.

(2) *Ringworm in the Ox.*—This is always caused by the trichophytes, and is generally seen in calves on the lips, head, neck, and upper parts of the body, less frequently on the lower parts and limbs. The hair stands on end, and on black-skinned animals the patches are covered with greyish scales; on white skins they are of a yellow colour and thinner. Under the scales there is a collection of pus, which drys up, leaving a smooth patch with hairs studded irregularly over its surface. At the commencement there is intense itching. A spontaneous cure will take place in from six weeks to three months.

The parasite is transmitted from one ox to another, and to the horse, goat, cat and dog after the skin has been scarified, also sheep, pig and rabbit; cases in man are also frequent.

The same treatment as in the horse is successful, but great care must be exercised in using mercurial preparations.

(3) *Ringworm in the Sheep, Goat and Pig.*—In these animals ringworm is not very common. In the sheep the wool is matted together in

* (1 to 30? Ed.)

locks by the crusts, on the neck, breast, shoulders, and along the back. In the pig the patches are isolated, red, or covered with brown scales. They are generally found on the back and outside of the thighs, but also on the ribs and flanks. It is transmissible to man.

(4) *Ringworm in the Dog.*—There are four varieties.

Trichophyton mentagrophytes and *T. caninum* form patches on the limbs and head, especially round the lips and eyes. These patches are covered with crusts, which at first are of a dirty grey colour, but afterwards turn yellow or brown, from the effects of rubbing. The skin underneath the scales is of a copper or dark red colour, with a number of small pimples on it.

Microsporum Audouini var. caninum forms dry greyish-coloured patches covered with broken hairs.

Eidamella spinosa has only been once recognised in the form of ringworm.

Oospora canina causes favus in the dog. There are hollow depressions with white crusts on the surface, and of a sulphur yellow towards the centre. They give off a repulsive, sickly smell.

These ringworms are transmissible to man, but easily treated, and either by a solution of corrosive sublimate or nitrate of silver ointment are readily curable.

(5) *Ringworm in the Cat.*—There are three varieties.

Trichophyton felvicum causes the hair to fall off in circular patches, which are covered with bran-like scales. It is contagious to the horse, ox, dog, and man.

Microsporosis of the cat (Marotel) causes bare patches that are covered with dry grey scales.

Favus chiefly attacks the paws, but it is also found on the head, forehead, ears, and nose. It forms thick, yellow, soft crusts that are depressed in the centre. There is not a great deal of itching. The parasite seems to be conveyed to the cat from mice.

(6) *Ringworm in the Rabbit.*—The exact nature of the parasite is unknown, but the patches resemble favus. They are found on the paws and head, sometimes on the body.

(7) *Ringworm in Poultry.*—The parasite is a favus, a lophophyte, which has nothing in common with the favus of man or the smaller mammalia. It is seen generally on the crest and wattles, as greyish-white, round or irregular confluent patches, covered with a thick, slimy fluid coating, which drys up. In some cases this scale drys up and assumes a circular form. The feathers, when the ringworm extends to them, stand up on end, dry, and break off, leaving bare patches that are covered with soft scales, that give off an offensive smell. The birds die from emaciation and weakness. The disease early spreads to man. It can be treated with benzine, calomel, or creolin ointment.

(8) *Onychomycosis in the Horse.*—Ercolani has given the parasite this name from its resemblance to certain conditions of the nails in man, but the *Achorion keratophagus* discovered by Ercolani and Baldoni is not the active agent of this condition of the horse's foot. It is found in the diseased sole as a simple saprophyte.

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OBSTETRICAL AND SURGICAL NOTES.

BY M. LÉON BEDEL, DOZULE, CALVADOS.

THE following is a summary of a paper read before the Central Veterinary Medical Society of Paris on May 17, 1906. The author has divided it into two parts, obstetrics and surgery.

OBSTETRICAL NOTES.

(1) *Early Puberty.*—Two cases are given in heifers. One calved at 13 months of age, after a very difficult labour, the perinæum being ruptured. In the second one the mother was 12 months old. She was seven months in calf. The case was complicated with inversion of the vagina.

(2) *Hereditary Supernumerary Teats.*—Out of 12 cows in calf he found that 9 had two supernumerary teats; out of these, 7 calves, viz., 5 heifers and 2 bulls, had them also. He suggests the possibility of breeding a race of cows with six teats.

(3) *The Reappearance of Œstrum after Calving.*—The author gives some careful observations. The longest was the sixty-eighth day, and the shortest the ninth. The average was from the thirtieth to the fiftieth day.

(4) *The Influence of Œstrum on Disease.*—Œstrum appears to have but a slight influence on the course of disease. The author, however, traces five cases of meningitis to it, also a few cases of slight colic.

(5) *The Influence of Œstrum and Illness on the Milk.*—The author has seen cases of gastro-intestinal disturbance in young children who have been fed on milk from cows in œstrum, suffering from aphthæ, or small-pox.

(6) *The Position of the Calf in Twin Pregnancy.*—Out of 19 cases of twins, in 13 the presentation was inverse; in 11 cases the first calf born was that naturally presented; in 3 cases both calves were presented anteriorly, and in 3 both were presented posteriorly.

(7) *Sterility.*—A case in a bull, from a tumour the size of a nut on the end of the penis; the growth was removed, and with it the trouble. In the female he relates one case in a heifer in which the vulva was so constricted that with difficulty a goose-quill was passed. In another the position of the vulva was abnormal, just behind the teats.

(8) *Dropsy of the Fœtal Membranes and its Relationship with Metritis.*—Four cases that came under notice with metritis caused by difficult parturition, again came in calf. In all four there was dropsy of the fœtal membranes.

(9) *Ante-partum Paraplegia.*—One case is mentioned in which it appeared at the ninth month, and was treated successfully. The author also mentions a case in a goat five days before parturition. She produced two kids, and died two days afterwards.

(10) *Death of the Fœtus from Rupture of the Cord.*—Two cases of death of the fœtus from rupture of the cord *in utero* are given. In one, rupture was caused in attempting to rectify a twisted uterus, and in the second by manipulations in a difficult case of calving. There were violent expulsive efforts, and a large amount of blood escaped. When examined the bodies of the fœtuses were quite bloodless, whereas the mothers had but little the matter with them.

(11) *Date of Death of the Calf.*—The author estimates the period at

which the fœtus died by the condition of the cornea. If it is transparent and cannot be depressed by the finger it indicates that death has taken place within twenty-four hours. If it has lost its transparent appearance, is easily depressed, and has white opaque patches on its surface, it has been dead several days: if it is opaque all over its surface, then death has taken place at least eight days previously.

(12) *Depraved Maternal Instinct.*—Usually the maternal instinct is strong in the female domestic animals. Four cases are mentioned—two in mares and two in cows—in which the mothers attacked their offspring so violently, and showed such an aversion to them, that they had to be separated.

(13) *Folded Uterus.*—Three cases are related. In two the fœtus was extracted by forceps, after unfolding the uterus from above downwards. In the third case the author attempted to roll the cow, but without any result. He considers that folds in the uterus are not always due to torsion, but are sometimes caused by retroflexion.

(14) *Dystokia from Dorso-pubic Position; Limbs Flexed at the Knees, Head Bent to the Lumbar Region.*—The case quoted shows that this class of complication may be reduced by forcible traction.

(15) *Dystokia from Contraction of the Neck.*—A case is mentioned caused by contraction of the neck of the fœtus. Delivery was accomplished by forcible traction on the limbs.

(16) *Dystokia from Sterno-abdominal Presentation, with Head turned Backwards.*—Traction on the fore limbs of the fœtus, as recommended in the text-books, the author condemns, and he usually removes the fore limbs. He points out the difficulty there is in the mare on account of the violent straining.

(17) *The Possibility of Unaided Delivery in Breech Presentation, with the Hind Limbs Flexed at the Hocks in the Cow.*—He states that this is possible, and mentions a case in twins, but explains it by the small size of the calves.

(18) *Adjustment of Hind Legs of Fœtus Flexed at the Hocks.*—This case also was one of twins. The first, which was a breech presentation, with the hind legs flexed at the hocks, was delivered without trouble, after they had been properly adjusted. In this case also the author attributes his success to the size of the calves.

(19) *Inversion of the Uterus in a Sow; Reduction; Birth of Two Dead Pigs without Recurrence of Inversion.*—The sow had been delivered of three pigs, when the violent straining caused inversion of the uterus. This was reduced, and the lips of the vulva sutured. The next day the sutures had torn out. The sow gave birth to two more pigs, which were dead, but the uterus remained in position.

Surgical Notes.

(1) *Reduction of Dislocation of the Patella.*—The fist is clenched, the thumb resting on the first joint of the index finger, which with the point of the thumb is pressed behind the outer edge of the angle of the patella, the knuckles of the other fingers resting on the external surface of the lower end of the femur. By a twisting movement of the wrist, pressure is exerted from behind forwards, and from above downwards, on the posterior part of the supra-external angle of the patella. An assistant steadies the horse, while support is given by the opposite hand on the anterior face of the limb. Two cases are

given in which the dislocation was reduced by this method after other means had failed.

(2) *Plan for Securing the Limbs during an Operation.*—Two strong hobbles are used, placed above the knee and hock on the same side, and drawn together with a rope, when the horse goes down, and they are secured. To let the animal up all that is necessary is to undo the knot and unbuckle the hobbles. The author claims their advantage over the side line to be that they are more easily and rapidly fixed, and the limbs are more firmly secured.

(3) *Removal of a Tumour from the Palate of an Ox.*—The animal had difficulty in swallowing, and on examination a large round tumour, attached by a pedicle to the gum on the right side, was found, filling up half the mouth. The bullock was thrown, and the mouth held open with a gag. The growth was caught in a loop of whipcord, and pulled off, leaving a clean wound that did not bleed.

(*Recueil de Médecine Vétérinaire.*)

FEBRILE MEAT AS FOOD.

BY E. CESARI, INSPECTOR OF THE VILLETTE ABATTOIR, PARIS, AND L. PANISSET, SANITARY VETERINARY INSPECTOR.

BAILLET, Villain, Bascoie and Galtier have pointed out that it by no means follows that what is known as "febrile" meat must necessarily have come from an animal that has been killed during an attack of fever. The description, however, that they give of this condition is vague, and the changes are not clearly pointed out.

The meat which inspectors designate as "febrile" is that which has undergone certain changes, chiefly characterised by the salmon colour of the muscles, infiltration of the interfascicular connective tissue, and a peculiar smell.

The muscular tissue when first cut has a reddish-brown colour, but turns a pale pink or salmon on contact with the air, and is most marked in the hind quarters. Veal has a grey earthy appearance.

The infiltration of the interfascicular and intermuscular connective tissues renders the meat soft and flabby, and when cut into there is an exudation of a clear pink serum, which is most abundant from the muscles of the hind quarters.

The smell given off is very peculiar and cannot be mistaken, and is particularly noticeable when the shoulder is separated from the body. It quickly disappears on exposure to the air. Veal has the smell of buttermilk.

The capillaries of the connective tissue are engorged with blood, and are most conspicuous on the inside of the shoulder and the connective tissue in the fold of the flank. In some cases there is a red, gelatinous œdema.

The fat may be either firm, of a red colour, with the capillaries injected, or of a milky white, and soft in consistence.

The medulla of the bones when opened is of a dull brown colour, that turns red on exposure to the air.

The lymphatic glands are hypertrophied, soft and hæmorrhagic.

These appearances are by no means constant, and it is by no means uncommon to find meat in which all the febrile characteristics are present in the muscular tissue, while the connective tissue, fat, bones and lymphatic glands are apparently healthy.

Last of all, cadaveric changes are seen, the muscles being dull in colour, the pleura and peritoneum leaden, and at the periphery of the muscles a zone of greyish discolouration.

These changes are most marked in beef and horse-flesh, they are not common in pork, and almost unknown in mutton.

The microscopic changes in febrile meat are not characteristic, and have nothing specific about them. In most cases, notwithstanding what the appearance of the meat is, the muscular tissue is swollen, the striæ disappear, and the nuclei stain badly. In many cases there is an infiltration of leucocytes.

By the hand or mechanical means it is possible to press out 10 per cent. of serum coloured with hæmoglobin, which contains 15 grammes per litre of albumin. This coagulates when boiled in an acidulated medium, and it always has an acid reaction corresponding to 6·5 grammes of sulphuric, or 8 grammes of lactic acid per litre on an average. This serum contains lactic acid, which can be detected by Offelmann's process, but no ammonia. After eliminating the albumin by boiling with acetic acid, phosphotungstic acid gives a profuse precipitate of soluble acid, albumin peptones, xanthin, and hypoxanthin. The second filtrate contains a large amount of nitrogenous material chiefly composed of creatin. Bacteriological examination of febrile muscle will show the presence in every case of microbes, in variable numbers, that seem to have no relationship with the extent of the lesions seen. The bacteria that have been isolated have not all been identified, but most of them are ærobic. The chief varieties are streptococci, staphylococci, and numerous different sorts of coli bacilli. The coli bacillus is almost always found, and it is very often seen in the blood and the gland pulp. A careful study will permit of the identification of these microbes with those that are normally present in the intestine. In many cases small quantities ($\frac{1}{2}$ cc.) of culture are pathogenic when injected subcutaneously or into the peritoneum of the guinea-pig.

Meat to which the term "febrile" may be truly applied presents certain characteristics, but it must be remembered that this is not applicable to all cases, as animals suffering from pleuro-pneumonia often furnish what is to all appearance healthy meat, while others which have been slaughtered during the course of intestinal diseases invariably have it markedly febrile. The fact of an animal having a high temperature before slaughter should always be looked upon with suspicion, and the meat be carefully examined. In febrile meat there are the characteristic primary muscular changes, *i.e.*, the colour, smell and exudation of serum, as well as secondary changes in the connective tissue, lymphatic glands and soft tissue of the bones. Meat of this description is usually from animals suffering from certain specific infectious diseases, such as charbon, rouget, septicæmia, &c., also acute inflammatory disease of the abdominal viscera, such as peritonitis, metritis, enteritis, diarrhœa in calves, &c. A second class consists of meat in which the muscle only is affected, the connective tissue and lymphatic glands being healthy; and in such meat micro-

organisms of the coli type are always present, the microbes having gained access to the blood through the walls of the intestine. This passage through the intestinal walls is seen in healthy animals, but takes place at an earlier stage in feeble, weak ones, such as when the beast is not slaughtered till nearly dying, or has suffered from some exhausting disease. It is also seen in injuries followed by severe shock. This passage through the intestinal walls takes place more readily when there is great increase of the organisms, as in indigestion; or when the phagocytosis is feeble or surpressed, as in colic, on account of the blood stasis and inhibitory action of the nervous system.

In meat of this class only the muscular tissue is implicated, and it is from animals in a feeble state, especially those which, on account of intestinal troubles, are not able to resist infection. Muscular lesions are not fully developed till some hours after slaughter, in some cows not for twenty-four. They develop very rapidly in a warm temperature, and green putrefaction soon sets in. Cold, on the contrary, hinders their development. Signs of acute peritonitis or congestion of the abdominal viscera should attract attention, and are generally sufficient of themselves to justify seizure, even before febrile symptoms manifest themselves. Carcases that show even the slightest signs of acute inflammation of the abdominal organs should always be kept for a day at a temperature of from 8° to 12° C., and only then passed if the muscles are of normal appearance. The carcases of animals that have been destroyed for accidents should be treated in a similar manner. As in many cases it is impossible to see the viscera, as with foreign meat, it is highly important to be able to recognise the external signs that denote that it is "febrile."

The injection of the superficial capillaries, the red colour of the fat, suet, and serous membranes, the vascular injection in the connective tissue, and the greyish colour of the surface of the muscles, together with the unnatural brown colour of the vertebræ when sawn in two are all very distinct and early recognised signs, and in addition there is a peculiar flabbiness of the whole of the carcase.

This flabbiness gives rise to a peculiar appearance in a hind quarter when hung up by the hock, which becomes rounder than natural, especially the inner side of the thigh, which hangs over the symphyses of the ischium and pubis; and to the fingers when handled it conveys a diffused fluctuating sensation.

The fore quarter is very easily moved on the trunk, as it is only attached by thin softened muscles. In every case where fever is suspected, the muscles, connective tissue and lymphatic glands should be carefully examined.

When the hind quarter is cut up into joints the condition of the intermuscular connective tissue can be seen. The popliteal glands and the large adductor muscle of the thigh should be incised. With the fore quarter it is sufficient to remove the shoulder, and the secondary lesions of the subscapular connective tissue can be noted, also the prescapular lymphatic glands.

In all cases it is advisable to make an examination of the blood, both fresh and coloured. If the blood has coagulated, or fresh specimens are difficult to obtain, a preparation of the pulp from a lymphatic gland can be used. In this way the cause of the attack may be discovered by the detection of a specific agent, such as the bacillus of charbon or rouget.

No matter what their origin is, febrile meat contains toxic properties, viz., potash salts, alexin in the serum, ptomaines, and proteid materials that form under the peculiar changes that such meat undergoes. In spite of these numerous substances, modern research (L. Panisset, "Sur la toxicité des viandes fiévreuses," *Revue Générale de Medécine Vétérinaire*, vol. vi., 1006, pp. 6-10) has failed to detect the direct toxic principle in the serum from febrile meat, which former observers claimed to have isolated (Monier et Huon "Accidentes produits par les conserves de viandes, leurs causes et les moyens de les éviter," *Revue Générale de Médecine Vétérinaire*, vol. iii., 1904, pp. 360, 363). All the same, the pathogenic action is indisputable, and undoubtedly it is due to microbic origin, and such meat is not fit for consumption, even after sterilisation, and should not be used for tinned or preserved food.

(*Revue Générale de Médecine Vétérinaire.*)

Books and Periodicals, &c., Received.

Veterinary News; Cape Agricultural Journal; Board of Agriculture and Fisheries; Les Maladies Rouges du Porc dans D'Evora (Portugal), by Signor Ramalho; Report of the Veterinary Surgeon for the Glasgow Corporation; Surgical Therapeutics of the Domesticated Animals (Cadiot and Almy, translated by Liautard); The Veterinary Student; Journal of the Royal Army Medical Corps; The Motor Car Journal; The Irish Farming World; Report of the Civil Veterinary Department of India; Rangoon Times; Times of Burmah.

Letters and Communications, &c.

Captain Sullivan; Colonel Nunn; Lieutenant Macdonald; Captain Williams; Mr. Townsend; Dr. Williams; Mr. Lawrence; Professor Taylor; Mr. Crossley; Professor Duncan.

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B. diphtheriæ	20·0	Journal of State Medicine, January, 1904.
B. typhosus	11·0	Journal of Royal Army Medical Corps, March, 1904.
B. dysenteriæ (Flexner)..	10·0	Laboratory Report, King's College, August, 1904.
Staph. p. aureus	9·3	Public Health, January, 1903.

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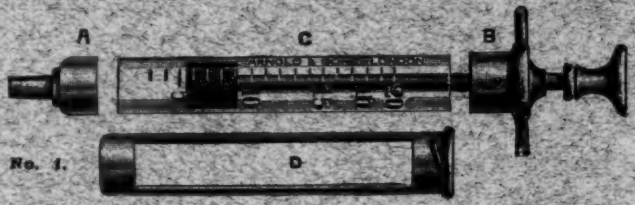

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